Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion™

AUG 1 4 2002

Docket No. 50-336
B18724

RE: 10 CFR 50.90

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

Millstone Nuclear Power Station, Unit No. 2
Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems,
Power Distribution Limits, And Special Test Exceptions

Pursuant to 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC) hereby proposes to amend Operating License DPR-65 by incorporating the attached proposed changes into the Millstone Unit No. 2 Technical Specifications. The purpose of the proposed changes is to remove ambiguity and improve usability of the current Millstone Unit No. 2 Technical Specification sections related to reactivity control systems, and power distribution limits. The proposed changes will clearly define operability and surveillance requirements for Shutdown Margin requirements, movable control element assemblies, and power distribution limits.

The proposed changes affect Definition 1.13, SHUTDOWN MARGIN, Technical Specifications 3/4.1.1.1, "Reactivity Control Systems, Shutdown Margin - T_{avg} > 200 °F," 3/4.1.1.2, "Reactivity Control Systems, Shutdown Margin - $T_{avg} \leq$ 200 °F," 3/4.1.1.3, "Reactivity Control Systems, Boron Dilution", 3/4.1.1.5, "Reactivity Control Systems, Minimum Temperature For Criticality," 3/4.1.3.1, "Reactivity Control Systems, Movable Control Assemblies, Full Length CEA Position," 3/4.1.3.3, "Reactivity Control Systems, Position Indicator Channels," 3/4.1.3.4, "Reactivity Control Systems, CEA Drop Time," 3/4.1.3.5, "Reactivity Control Systems, Shutdown CEA Insertion Limits," 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits," 3/4.2.1, "Power Distribution Limits, Linear Heat Rate," 3/4.2.3, "Power Distribution Limits, Total Unrodded Integrated Radial Peaking Factor - F^T_r," 3/4.2.4, "Power Distribution Limits, Azimuthal Power Tilt - T_q," 3/4.3.1.1, "Reactor Protective Instrumentation," 3/4.3.2.1, "Engineered Safety Feature Actuation System Instrumentation," 3/4.4.9, "Reactor Coolant System, Pressure/Temperature Limits," 3/4.9.1, "Refueling Operations, Boron Concentrations," 3/4.10.1, "Special Test Exceptions, Shutdown Margin," 3/4.10.3,

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"Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality," 3/4.10.4, "Special Test Exceptions, Physics Tests," 3/4.10.5, "Special Test Exceptions, Center CEA Misalignment," and 5.3.2, "Design Features, Control Element Assemblies." The corresponding Index pages and Bases sections will also be revised to reflect these changes.

Attachment 1 provides a discussion of the proposed changes and the Safety Summary. Attachment 2 provides the Significant Hazards Consideration. Attachment 3 provides the marked-up version of the appropriate pages of the current Technical Specifications. Attachment 4 provides the retyped pages of the Technical Specifications and associated Bases.

Environmental Considerations

DNC has evaluated the proposed changes against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.22. DNC has determined that the proposed changes meet the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and as such, has determined that no irreversible consequences exist in accordance with 10 CFR 50.92(b). This determination is based on the fact that the changes are being proposed as an amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to use of a facility component located within the restricted area, as defined by 10 CFR 20, or that changes a surveillance requirement, and that the amendment request meets the following specific criteria.

(i) The proposed changes involve no Significant Hazards Consideration.

As demonstrated in Attachment 2, the proposed changes do not involve a Significant Hazards Consideration.

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

The proposed amendment will address changes in Technical Specifications related to Reactivity Control Systems, Power Distribution Limits, and Special Test Exceptions. However, the operability requirements for equipment associated with these Technical Specifications will remain the same. The proposed changes are consistent with the design basis of the plant. The proposed changes will not result in an increase in power level, will not increase the production of radioactive waste and byproducts, and will not alter the flowpath or method of disposal of radioactive waste or byproducts. Therefore, the proposed changes will not increase the type and amounts of effluents that may be released off site.

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

The proposed amendment will address changes in Technical Specifications related to Reactivity Control Systems, Power Distribution Limits, And Special Test Exceptions. However, the operability requirements for equipment associated with these Technical Specifications will remain the same. The proposed changes will not result in changes in the configuration of the facility. There will be no change in the level of controls or methodology used for processing radioactive effluents or the handling of solid radioactive waste. There will be no change to the normal radiation levels within the plant. Therefore, there will be no increase in individual or cumulative occupational radiation exposure resulting from the proposed changes.

Conclusions

The proposed changes were evaluated and we have concluded that they are safe. The proposed changes do not involve an impact on public health and safety (see the Safety Summary provided in Attachment 1) and do not involve a Significant Hazards Consideration pursuant to the provisions of 10 CFR 50.92 (see the Significant Hazards Consideration provided in Attachment 2).

Site Operations Review Committee and Nuclear Safety Assessment Board

The Site Operations Review Committee and Nuclear Safety Assessment Board have reviewed and concurred with the determinations.

Schedule

We request issuance by end of August, 2003, with the amendment to be implemented within 90 days of issuance.

State Notification

In accordance with 10 CFR 50.91(b), a copy of this License Amendment Request is being provided to the State of Connecticut.

There are no regulatory commitments contained within this letter.

If you should have any questions regarding this submittal, please contact Mr. Ravi Joshi at (860) 440-2080.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

J. Alan Price
Site Vice President - Millstone

Sworn to and subscribed before me

this 14 day of August, 2002

Notary Public

WM. E. BROWN
NOTARY PUBLIC
MY COMMISSION EXPIRES MAR. 31, 2005

My Commission expires

Attachments (4)

cc: H. J. Miller, Region I Administrator
R. B. Ennis, NRC Senior Project Manager, Unit No. 2
Senior Resident Inspector, Unit No. 2

Director
Bureau of Air Management
Monitoring and Radiation Division
Department of Environmental Protection
79 Elm Street
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Attachment 1

Millstone Nuclear Power Station, Unit No. 2

Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems,
Power Distribution Limits, And Special Test Exceptions
Discussion of Changes and Safety Summary

Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems, Power Distribution Limits, And Special Test Exceptions
Discussion of Changes

Dominion Nuclear Connecticut, Inc. (DNC) hereby proposes to amend Operating License DPR-65 by incorporating the attached proposed changes into the Millstone Unit No. 2 Technical Specifications. The purpose of the proposed changes is to remove ambiguity and improve usability of the current Millstone Unit No. 2 Technical Specification sections related to reactivity control systems, and power distribution limits. The proposed changes will clearly define operability and surveillance requirements for Shutdown Margin requirements, movable control element assemblies, and power distribution limits. The proposed amendment will address changes in Technical Specifications related to Reactivity Control Systems, Power Distribution Limits, and Special Test Exceptions.

The proposed changes affect Definition 1.13, SHUTDOWN MARGIN, Technical Specifications 3/4.1.1.1, "Reactivity Control Systems, Shutdown Margin - $T_{avg} > 200$ °F," 3/4.1.1.2, "Reactivity Control Systems, Shutdown Margin - $T_{avg} \leq 200$ °F," 3/4.1.1.3, "Reactivity Control Systems, Boron Dilution", 3/4.1.1.5, "Reactivity Control Systems, Minimum Temperature For Criticality," 3/4.1.3.1, "Reactivity Control Systems, Movable Control Assemblies, Full Length CEA Position," 3/4.1.3.3, "Reactivity Control Systems, Position Indicator Channels," 3/4.1.3.4, "Reactivity Control Systems, CEA Drop Time," 3/4.1.3.5, "Reactivity Control Systems, Shutdown CEA Insertion Limits," 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits," 3/4.2.1, "Power Distribution Limits, Linear Heat Rate," 3/4.2.3, "Power Distribution Limits, Total Unrodded Integrated Radial Peaking Factor - F^T_r," 3/4.2.4, "Power Distribution Limits, Azimuthal Power Tilt - T_q," 3/4.3.1.1, "Reactor Protective Instrumentation," 3/4.3.2.1, "Engineered Safety Feature Actuation System Instrumentation," 3/4.4.9, "Reactor Coolant System, Pressure/Temperature Limits," 3/4.9.1, "Refueling Operations, Boron Concentrations," 3/4.10.1, "Special Test Exceptions, Shutdown Margin," 3/4.10.3, "Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality," 3/4.10.4, "Special Test Exceptions, Physics Tests," 3/4.10.5, "Special Test Exceptions, Center CEA Misalignment," and 5.3.2, "Design Features, Control Element Assemblies." The corresponding Index pages and Bases sections will also be revised to reflect these changes.

Description of The Proposed Changes

A. Specifications 3/4.1.1.1 and 3/4.1.1.2

Specifications 3/4.1.1.1, "Reactivity Control Systems, Shutdown Margin - $T_{avg} > 200$ °F" and 3/4.1.1.2, "Reactivity Control Systems, Shutdown Margin - $T_{avg} \leq 200$ °F" are combined as Specification 3/4.1.1.1. Additionally the following changes are incorporated:

1. The revised Technical Specification 3/4.1.1.1 combines the existing Technical Specifications 3/4.1.1.1 and 3/4.1.1.2. The APPLICABILITY is changed from "MODES 1, 2, 3 and 4" in Specification 3/4.1.1.1 and "MODE 5" in Specification 3/4.1.1.2 to "MODES 3, 4 and 5" in the revised Specification. MODES 1 and 2 are not covered any longer. A footnote is added to MODE 3 in APPLICABILITY to reference Special Test Exception 3.10.1.

2. Maintain only the SURVEILLANCE REQUIREMENT pertaining to the LIMITING CONDITION FOR OPERATION (LCO) and APPLICABILITY by removing Specifications 4.1.1.1.1a, b, and c and 4.1.1.2a. Specification 4.1.1.1.1d and 4.1.1.2b are combined into Specification 4.1.1.1 after relocating the additional wording on factors to be considered in the SHUTDOWN MARGIN (SDM) determination to the corresponding BASES section.

3. Specification 4.1.1.1.2 which addresses Core Reactivity Balance is removed. A new Technical Specification 3/4.1.1.2 is added to address Core Reactivity Balance.

4. The revised Technical Specification 3/4.1.1.1 is not applicable in MODE 2. Therefore, the footnote associated with MODE 2 in the existing Specification 3.1.1.1 is removed.

5. The corresponding BASES sections are updated to reflect these changes.

Justification of Changes:

1. Combining Technical Specifications 3/4.1.1.1 and 3/4.1.1.2 after removing Specifications 4.1.1.1.1a, b, and c and 4.1.1.2a and replacing Specification 4.1.1.1.2 with a new Technical Specification 3/4.1.1.2 is consistent with TSTF-136 which was approved by the NRC on May 2, 1997.[1]

2. In MODES 1 and 2, SDM is ensured by complying with Specifications 3/4.1.3.5, "Reactivity Control Systems, Shutdown CEA Insertion Limit," and 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits." If the insertion limits of LCO 3.1.3.5 or LCO 3.1.3.6 are not being complied with, the required action calls for restoring CEAs to within limits within 2 hours or otherwise be in MODE 3 within the next 6 hours. For Regulating CEAs the other option is power reduction to less than or equal the fraction of RATED THERMAL POWER allowed by the CEA group position and insertion limit specified in the CORE OPERATING LIMITS REPORT (COLR) within 2 hours or otherwise be in MODE 3 within the next 6 hours. Therefore, there is no need to include MODES 1 and

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(1) TSTF-136, "Industry/TSTF Standard Technical Specification Change Traveler, Combine LCO 3.1.1 and 3.1.2," NRC approved on May 2, 1997.

2 in the APPLICABILITY of Specification 3/4.1.1.1. This change is also consistent with NUREG-1432.[2]

3. Adding a footnote referencing Special Test Exception 3.10.1 to APPLICABILITY in MODE 3 is for clarification purposes. Special Test Exception 3.10.1 takes exemption from the requirements of Technical Specification 3/4.1.1.1 in MODE 3.

4. Specifications 4.1.1.1.1a, b, and c and 4.1.1.2a are removed:

   - Specification 4.1.1.1.1a is covered by Condition D and Required Action D.1 in the revised Technical Specification 3/4.1.3.1, "Reactivity Control Systems, Movable Control Assemblies, CEA Position," in MODES 1 and 2. In MODES 3, 4 and 5 the reactor is shut down and is not producing fission power. The operability of shutdown and regulating CEAs has the potential to affect the required SDM, but this effect can be compensated for by an increase in the boron concentration of the Reactor Cooling System (RCS) as required by the LCO. Therefore, there is no need for Specifications 4.1.1.1.1a and 4.1.1.2a in MODES 3, 4 and 5. This change is also consistent with NUREG-1432.

   - Specification 4.1.1.1.1b is covered by Specification 4.1.3.6.1 in the revised Technical Specification 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits." Therefore, this specification is not needed. This change is also consistent with NUREG-1432.

   - Specification 4.1.1.1.1c is not required since the SDM is satisfied and confirmed by the safety analyses as long as the CEA groups are within or at the insertion limits specified by Technical Specifications 3/4.1.3.5 and 3/4.1.3.6. If the CEA groups are inserted beyond the limits, the provisions of revised Technical Specifications 3/4.1.3.5 and 3/4.1.3.6 become applicable. Therefore, Specification 4.1.1.1.1c can be deleted. This change is also consistent with NUREG-1432.

5. Specification 4.1.1.1.2 is replaced with a new Technical Specification 3/4.1.1.2, "Reactivity Control Systems, Reactivity Balance." If the reactivity balance is not within the limits, the new Technical Specification requires re-evaluating core design and safety analyses and determine that the reactor core is acceptable for continued operation within 7 days or otherwise be in MODE 3 within the next 6 hours. Following evaluations of core design and safety analyses, the specification requires establishing appropriate operating restrictions and Surveillance Requirements within 7 days or otherwise be in MODE 3 within the next 6 hours. The new Technical Specification also requires verification of reactivity balance prior to entering MODE 1 after fuel loading and at least once every 31 Effective Full Power Days (EFPD). These requirements are more

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[2] NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants," Rev. 2, 2001.

conservative than Specification 4.1.1.1.2 requirements. Therefore, Specification 4.1.1.1.2 is replaced with a new Technical Specification 3/4.1.1.2. This change is also consistent with NUREG-1432.

B. Specifications 3/4.1.1.3, 3/4.1.1.5, 3/4.3.1.1, 3/4.3.2.1 and 3/4.4.9.1

The notes and footnotes referencing Special Test Exception 3.10.3 or 3.10.4 are removed. Technical Specifications 3/4.10.3, "Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality" and 3/4.10.4, "Special Test Exceptions, Physics Tests," are proposed to be deleted. A typographical error contained in Table 3.3-3 Action 2.a. is being corrected. This is a non technical change.

C. Specification 3/4.1.3.1

Description:

The following changes are incorporated:

1. The LCO is revised to state the requirement on CEA operability and alignment first then the requirement on CEA Motion Inhibit operability second. An additional requirement on the operability of the CEA Deviation Circuit is added.

2. Format ACTION into a tabular form consisting of a column describing the "INOPERABLE EQUIPMENT" and a column describing the "REQUIRED ACTION."

3. Action statements are organized such that Actions A and D address CEA operability and alignment, and Actions B and C address the requirement on CEA Motion Inhibit and Deviation Circuit operability.

4. Action c which allows operation for up to 7 days in MODES 1 and 2 with one CEA inoperable (unless untrippable) is deleted.

5. In Actions d and e, the operation for up to 7 days in MODES 1 and 2 with the specified CEAs misalignment is deleted.

6. The requirements to determine SHUTDOWN MARGIN in Actions a., d.2., and e. are deleted.

7. Action d.2.b. is deleted and the Bases section is modified to describe how CEA misalignment can be restored.

8. The time allowed to restore the misalignment in Actions d. and e. is increased from 1 hour to 2 hours.

9. Actions d. and e. are combined as Action A.

10. In action A., an additional requirement is added to reduce THERMAL POWER to less than 70% within 1 hour.

11. With CEA Motion Inhibit inoperable (Action B.1), an additional requirement is added to verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter while working to restore CEA Motion Inhibit to OPERABLE.

12. Action B.2 is slightly modified by removing the word "fully" and replacing "< 5% insertion" with ≥172 steps."

13. An additional action C. is added to address the condition of an inoperable CEA Deviation Circuit.

14. The wording "or otherwise be in MODE 3 within the next 6 hours" is added to the Required Actions in the revised Technical Specification.

15. The part of Specification 4.1.3.1.1 dealing with inoperable Deviation Circuit and/or CEA Motion Inhibit is deleted. Additional surveillance requirement is added to verify indicated position within 1 hour following any CEA movement larger than 10 steps.

16. Specification 4.1.3.1.2 is reworded to replace "determined to be OPERABLE" by "Verify CEA freedom of movement (trippability)."

17. In Specification 4.1.3.1.3, a slight modification of wording is used.

18. In Specification 4.1.3.1.4, a slight modification of wording is used.

19. The corresponding BASES sections are updated to reflect these changes.

Justification of Changes:

1. The LCO addresses primarily the requirement on CEA operability and alignment. Therefore, the LCO is revised to state requirements in the proper order. This change is also consistent with NUREG-1432.

2. Formatting ACTION into a tabular form consisting of a column describing the "INOPERABLE EQUIPMENT" and a column describing the "REQUIRED ACTION," provides a more effective way of logically organizing conditions and associated actions in a manner that eliminates any ambiguity. A similar format

was used in Technical Specification 3/4.6.2.2 which was approved by the NRC as part of amendment No. 215. [3]

3. Action statements are organized to address CEA operability and alignment first then the requirement on CEA Motion Inhibit and Deviation Circuit operability second. This change is also consistent with NUREG-1432.

4. Action c. is rarely being used during the operation of Millstone Unit No. 2. Continued operation without reducing power even with a small misalignment results in:

   - A small effect on the time dependent long term power distributions relative to those used in generating LCOs and limiting safety system settings (LSSS) setpoints;

   - A small effect on the available SDM; and

   - A small effect on the ejected CEA worth used in the accident analysis.

   These effects, although small, are undesirable. Therefore, Action c. is deleted. This change is more conservative and also consistent with NUREG-1432.

5. In Actions d. and e., the operation for up to 7 days in MODES 1 and 2 with the specified CEAs misalignment is deleted because of the same reasons cited in item 4 above and therefore, it is more conservative.

6. In actions A. of the revised specification, additional requirement is added to reduce THERMAL POWER to less than 70% within 1 hour. Xenon redistribution in the core starts to occur as soon as a CEA becomes misaligned. Reducing THERMAL POWER ensures acceptable power distribution is maintained. The prerequisite of reducing THERMAL POWER to less than 70% will reduce the effects associated with CEAs misalignment on the core. This permits an increase in the time allowed to restore CEAs misalignment from 1 hour to 2 hours in Actions d. and e. The duration of 2 hours will give operators more time to restore misalignment without significant effect on the core. This change is also consistent with NUREG-1432.

7. The required Actions to mitigate conditions d. and e. are combined to create one Action item dealing with CEAs. This change provides a more effective way of logically organizing conditions and associated actions in a manner that eliminates any ambiguity. This change is also consistent with NUREG-1432.

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[3] D. G. McDonald to M. L. Bowling, Amendment No. 215, "Millstone Nuclear Power Station, Unit No. 2 - Issuance of Amendment (TAC NO. M99504)", dated May 26, 1998.

8. The requirements to determine SHUTDOWN MARGIN in Actions a., d.2., and e. are deleted. The deletion of these requirements has been approved by the NRC in Technical Specification change traveler TSTF-67[4] on August 11, 1997. The justification provided in TSTF-67 is based on the argument that the SHUTDOWN MARGIN definition and the CEA Actions requiring the verification of SHUTDOWN MARGIN force computation of SHUTDOWN MARGIN that is not reflected in the safety analyses which presume that the scram worth available is that given by the Power Dependent Insertion Limit (PDIL) at the initial power level. Such a computation of SHUTDOWN MARGIN has no direct relationship to the scram worth used in the safety analyses covering power conditions. As such, this computation can falsely and misleadingly confirm that the current condition is acceptable when, in fact, it is not. This change is also consistent with NUREG-1432.

9. Action d.2.b. is deleted and the Bases section is modified to describe how CEA misalignment can be restored. The deletion of these requirements has been approved by the NRC in Technical Specification change traveler TSTF-143[5] on March 14, 1997. The justification provided in TSTF-143 is based on the argument that Action d.2.b. contains details on how to restore alignment that are not required in the Actions. This information is added in the Bases which state that within 2 hours the misaligned CEA(s) must be restored to within 10 steps of its group or the misaligned CEA's group must be aligned to within 10 steps of the misaligned CEA. The Bases will clarify that aligning a shutdown CEA's group to within 10 steps of the misaligned CEA is not permitted. This change is also consistent with NUREG-1432.

10. With CEA Motion Inhibit inoperable (Action b.1.), the additional requirement to verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter, while working to restore CEA Motion Inhibit to OPERABLE, ensures improper CEA alignments are identified before unacceptable power distribution occurs. This change is also consistent with NUREG-1432.

11. In Action b.2., removing the word "fully" and replacing "< 5% insertion" with "≥ 172 steps" does not change the requirements of this action statement. The change is needed to clarify and quantify the "5% insertion" in terms of the number of steps withdrawn.

12. The additional action to address the condition of an inoperable CEA Deviation Circuit ensures improper CEA alignments are identified before unacceptable power distribution occurs. This change is also consistent with NUREG-1432.

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(4) TSTF-67, "Correction of shutdown definition," approved on August 11, 1997.

(5) TSTF-143, "Consolidate Specification 3.1.5 Actions to Restore Misaligned CEAs," approved on March 14, 1997.

13. If the Required Action is not completed within the allowed outage time, plant shutdown shall commence and the unit shall be in MODE 3 within the "next" 6 hours following the allowed outage time specified in the action statement. This change is also consistent with NUREG-1432.

14. The part of Specification 4.1.3.1.1 dealing with inoperable Deviation Circuit and/or CEA Motion Inhibit is deleted. This part is added as actions B. and C. addressing inoperable Deviation Circuit and CEA Motion Inhibit. Since the most likely condition for a CEA to become misaligned is during CEA movement, an additional surveillance requirement is added to verify indicated position within 1 hour following any CEA movement larger than 10 steps.

D. Specification 3/4.1.3.3

Description:

1. In Action item b.3., delete "for the existing Reactor Coolant Pump combination."

2. In Surveillance Requirement 4.1.3.3, delete "except during time intervals when the Deviation Circuit is inoperable, then compare the pulse counting position indicator and the reed switch position indicator channels at least once per 4 hours."

Justification of Changes:

1. In Action item b.3., the words "for the existing Reactor Coolant Pump combination" are deleted. Millstone Unit No. 2 can only operate in Modes 1 and 2 with 4 Reactor Coolant Pumps (RCP) operating in accordance with Technical Specification 3/4.4.1.1. Therefore, these words are not needed.

2. In Surveillance Requirement 4.1.3.3, the part "except during time intervals when the Deviation Circuit is inoperable, then compare the pulse counting position indicator and the reed switch position indicator channels at least once per 4 hours" is deleted. This part is covered by Action item C. in the revised Technical Specification 3/4.1.3.1 which requires verification of rod position every 4 hours when the CEA Deviation Circuit is inoperable. This verification would involve the operators checking the reed switch position indicator and pulse countering position indicator.

E. Specification 3/4.1.3.4

Description:

1. In the LCO, delete the words "full length (shutdown and control)."

2. In Action item a delete the words "full length."

3. In Surveillance Requirement 4.1.3.4 delete the words "of full length."

4. Delete Action item b.

Justification

1. Millstone Unit No. 2 does not have any part length CEAs. All the CEAs are full length. Therefore the words "full length" are not needed.

2. This Technical Specification is applicable to all CEAs. There is no need for the words "(shutdown and control)." Therefore, these words are deleted.

3. Millstone Unit No. 2 can only operate in Modes 1 and 2 with 4 RCPs operating in accordance with Technical Specification 3/4.4.1.1. CEA Drop Time testing cannot be performed in MODES 1 and 2 with less than 4 RCPs operating. The condition described in Action item b cannot exist while Millstone Unit No. 2 is operating in MODES 1 and 2. Therefore, this Action item is deleted.

F. Specification 3/4.1.3.5

Description:

The following changes are incorporated:

1. The LCO is revised to use the scientific symbol "≥" instead of "at least".

2. Format ACTION into a tabular form consisting of a column describing the "INOPERABLE EQUIPMENT" and a column describing the "REQUIRED ACTION."

3. The condition description is changed from "With a maximum of one CEA withdrawn.." to "One or more shutdown CEAs not within limit." The part "except for surveillance testing pursuant to Specification 4.1.3.1.2" is removed and added, with some wording changes, as footnote (1) to applicability MODES.

4. The time limit to restore CEAs position to the insertion limit is changed from 1 hour to 2 hours.

5. Action 3.1.3.5b. is deleted.

6. The wording "or otherwise be in MODE 3 within the next 6 hours" is added to the Required Actions in the revised Technical Specification.

7. The scientific symbol "≥" is used instead of "at least." Additionally, item a. in Surveillance Requirement 4.1.3.5 is removed and replaced with the wording

"with any regulating CEA not fully inserted" added to the Applicability statement.

8. The footnote referencing Special Test Exception 3.10.2 is modified by adding Special Test Exception 3.10.1.

Justification

1. The use of the scientific symbol "≥" instead of "at least" provides a logically equivalent way of expressing the insertion limits of the shutdown CEAs. This change is also consistent with NUREG-1432.

2. Formatting ACTION into a tabular form consisting of a column describing the "INOPERABLE EQUIPMENT" and a column describing the "REQUIRED ACTION," provides a more effective way of logically organizing conditions and associated actions in a manner that eliminates any ambiguity. A similar format was used in Technical Specification 3/4.6.2.2 which was approved by the NRC as part of amendment No. 215.

3. The existing action statement does not provide the required remedial action if more than one shutdown CEA are not within the insertion limits. Replacing the words "With a maximum of one CEA withdrawn.." with "One or more shutdown CEAs not within limit" in the action statement defines the required actions in this case. This change is also consistent with NUREG-1432. Removal of the part "except for surveillance testing pursuant to Specification 4.1.3.1.2" and adding it, with some wording changes, as a foot note to the applicability MODES simplifies the condition description and makes it consistent with NUREG-1432.

4. If the Required Action is not completed within the allowed outage time, plant shutdown shall commence and the unit shall be in MODE 3 within the "next" 6 hours following the allowed outage time specified in the action statement. The 6 hours allowed for completion is reasonable for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems. This change is also consistent with NUREG-1432.

5. The wording "except for surveillance testing pursuant to Specification 4.1.3.1.2" in the action statement describes limitation on the applicability of this Technical Specification. It belongs in the Applicability statement. Therefore, this wording is deleted and replaced with footnote (1) added to the Applicability statement.

6. The required action allows 2 hours for restoring the CEA(s) to within limits. The 2 hour total completion time allows the operator adequate time to adjust the CEA(s) in an orderly manner and is consistent with the required action in Technical Specification 3.1.3.1, "Movable Control Assemblies, CEA Position." This change is also consistent with NUREG-1432.

7. Deletion of Action 3.1.3.5b. leads to a more conservative action statement. This deletion will not allow operating the reactor beyond the 2 hours allowed time to restore shutdown CEA(s) alignment (Specification 3.1.3.1 will allow power reduction to < 70% of maximum allowed THERMAL power within 1 hour and restore alignment within 2 hours). This change is also consistent with NUREG-1432.

8. Surveillance Requirement 4.1.3.5 which states "Prior to withdrawal of any CEAs in regulating groups during an approach to reactor criticality, and" is removed and replaced with a limitation in the Applicability statement of the Technical Specification in Mode 2. The wording added to the applicability statement states "with any regulating CEA not fully inserted." This additional limitation will ensure that all shutdown CEAs shall be withdrawn to > 176 steps prior the withdrawal of any CEAs in the regulating group. This change is also consistent with NUREG-1432.

9. Modifying the footnote referencing Special Test Exception 3.10.2 by adding also Special Test Exception 3.10.1 makes the applicability in MODE 2 consistent with the proposed revision to Special Test Exception 3.10.1. The proposed revision to Special Test Exception 3.10.1 will add Technical Specification 3/4.1.3.5 to the list of exceptions.

G. Specification 3/4.1.3.6

Description:

1. An additional requirement on the power dependent insertion limit (PDIL) alarm circuit is added to the LCO. This requirement states that: "The power dependent insertion limit (PDIL) alarm circuit shall be OPERABLE."

2. The part of LCO stating: "Regulating CEAs are considered to be fully withdrawn when withdrawn to at least 176 steps," is relocated to Bases section 3/4.1.3, "Movable Control Assemblies."

3. The part of LCO stating: "CEA insertion between the Long Term Steady State Insertion Limits and the Transient Insertion Limits restricted to the limits provided in the CORE OPERATING LIMITS REPORT," is deleted.

4. Footnote (2) is added. The footnote states that: "This LCO is not applicable while performing Specification 4.1.3.1.2."

5. Format ACTION into a tabular form consisting of a column describing the "INOPERABLE EQUIPMENT" and a column describing the "REQUIRED ACTION."

6. The wording "except for surveillance testing pursuant to Specification 4.1.3.1.2" in ACTION item a. of the current specification is deleted.

7. The wording "except during operation pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1" in ACTION item b. of the current specification is deleted.

8. In ACTION item B., an ACTION completion time limit of 15 minutes is imposed.

9. The wording "except during operation pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1" in ACTION item c. of the current specification is deleted.

10. The ACTION "Be in HOT STANDBY within 4 hours" in ACTION item c. of the current specification is deleted.

11. Action D. is added. This ACTION addresses PDIL alarm circuit operability.

12. The wording "Be in MODE 3 within the next 6 hours" or "or otherwise be in MODE 3 within the next 6 hours" is added to each of the Required Actions in the revised Technical Specification.

13. Specification 4.1.3.6 is divided into Specifications 4.1.3.6.1 and 4.1.3.6.2.

14. The wording "except during time intervals when the PDIL alarm is inoperable, then verify the individual CEA positions at least once per 4 hours" in current Specification 4.1.3.6 is deleted and the wording: "The provisions of Specification 4.0.4 are not applicable for entering into MODE 2 from MODE 3" is added.

15. A new Surveillance Requirement 4.1.3.6.3 is added to verify PDIL alarm circuit operability.

16. The footnote referencing Special Test Exception 3.10.2 is modified by adding also Special Test Exception 3.10.1.

Justification

1. An additional requirement on the operability of the PDIL alarm circuit is added to the LCO. The PDIL alarm circuit is required to be OPERABLE for notification that the CEAs are outside the required insertion limits. When the PDIL alarm circuit is inoperable, the verification of CEA positions is increased to ensure improper CEA alignment is identified before unacceptable flux distribution occurs. This change is also consistent with NUREG-1432.

2. The part of LCO stating: "Regulating CEAs are considered to be fully withdrawn when withdrawn to at least 176 steps," does not represent by itself a LIMITING CONDITION FOR OPERATION, but serves to clarify the definition of a fully withdrawn CEA. It is more appropriate to address this clarification in Bases section 3/4.3.1. This change is also consistent with NUREG-1432.

3. The part of LCO stating: "CEA insertion between the Long Term Steady State Insertion Limits and the Transient Insertion Limits restricted to the limits provided in the CORE OPERATING LIMITS REPORT," is already addressed under ACTIONS (under Inoperable Equipment B. and C.) in the revised Specification 3/4.1.3.6. There is no need to have this wording as part of the LCO. This change is also consistent with NUREG-1432.

4. The wording: "except for surveillance testing pursuant to Specification 4.1.3.1.2" which is part of ACTION item a. in the existing specification is actually an exception to the applicability of the LCO. It is more appropriate to delete the wording from ACTION item a. and add it as footnote (1). The wording of the footnote is modified to state: "This LCO is not applicable while performing Specification 4.1.3.1.2." This change is also consistent with NUREG-1432.

5. Formatting ACTION into a tabular form consisting of a column describing the "INOPERABLE EQUIPMENT" and a column describing the "REQUIRED ACTION," provides a more effective way of logically organizing conditions and associated actions in a manner that eliminates any ambiguity. A similar format was used in Technical Specification 3/4.6.2.2 which was approved by the NRC as part of amendment No. 215.

6. The deletion of the wording "except for surveillance testing pursuant to Specification 4.1.3.1.2" in Action Item a. and the wording "except during operation pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1" in Action item b. and c. of the existing specification and the addition of footnote (1) is more appropriate as described in item 4 above. This change is also consistent with NUREG-1432.

7. The existing specification does not specify a completion time for ACTION items b.1. and b.2. A completion time of 15 minutes is imposed in the revised specification. If the CEAs are inserted between the long term steady state insertion limits and the transient insertion limits for intervals > 4 hours per 24 hour period, and the short term steady state insertion limits are exceeded, power peaking can develop which becomes of immediate concern. Additionally, since the CEAs can be in this condition without misalignment, penalty factors are not inserted in the core protection calculators to compensate for the developing peaking factors. Verifying the short term steady state insertion limits are not exceeded ensures that the peaking factors that do develop are within those allowed for continued operation. The period of

fifteen minutes provides adequate time for the operator to verify if the short term steady state insertion limits are exceeded. Furthermore, experience has shown that rapid power increases in areas of the core, in which the flux has been depressed, can result in fuel damage as the Linear Heat Rate (LHR) in those areas rapidly increases. Restricting the rate of THERMAL POWER increases to < 5% Rated Thermal Power per hour within fifteen minutes, following CEA insertion beyond the long term steady state insertion limits, ensures the power transients experienced by the fuel will not result in fuel failure. This change is also consistent with NUREG-1432.

8. The wording: "except during operation pursuant to the provisions of ACTION items c.. and d. of Specification 3.1.3.1" is deleted in action item c. The revised Specification 3.1.3.1 does not allow continuing operation in MODES 1 and 2 for up to 7 days with one CEA inoperable. The original Action item c. or its equivalent does not exist in the revised specification. Therefore, reference to item c. is deleted. Additionally the revised Specification 3.1.3.1 contains in Required Action A.3 the appropriate linkage between Specification 3.1.3.1 and 3.1.3.6. Therefore, reference to item d. or its equivalent is deleted. This change is also consistent with NUREG-1432.

9. ACTION c.2. stating "Be in HOT STANDBY within 4 hours," is deleted. This action is already covered in the revised specification in all action items by requiring the unit to be in MODE 3 within 6 hours when any of the Required Actions not met. This change is also consistent with NUREG-1432.

10. Condition and Required Action D. is added to address PDIL alarm circuit operability. It is more appropriate to remove this condition and associated required action from the existing Surveillance Requirement 4.1.3.6 and to add it as Required Action D. in the revised specification. The wording "except during time intervals when the PDIL alarm is inoperable, then verify the individual CEA positions at least once per 4 hours" in Specification 4.1.3.6 is therefore deleted. This change is also consistent with NUREG-1432.

11. If the Required Action is not completed within the allowed outage time, plant shutdown shall commence and the unit shall be in MODE 3 within the "next" 6 hours following the allowed outage time specified in the action statement. This change is also consistent with NUREG-1432.

12. Specification 4.1.3.6 addresses two aspects which are covered by two separate Required Actions namely: a) surveillance of regulating CEA groups positions with respect to the Transient Insertion Limits, and b) the accumulated times during which regulating CEA groups are inserted between the Long Term Steady State Insertion Limits and Transient Insertion Limits. Specification 4.1.3.6 is divided in the revised Specification into Specifications 4.1.3.6.1 and 4.1.3.6.2 to be consistent with the Required Actions. Additionally, the clarification "The provisions of Specification 4.0.4 are not applicable for

entering into MODE 2 from MODE 3," is added to revised Specification 4.1.3.6.1. This clarification ensures that entry is allowed into MODE 2 without having performed Surveillance Requirement 4.1.3.6.1. This is necessary, since the unit must be in the applicable MODES in order to perform Surveillances that demonstrate the LCO limits are met.

13. Specification 4.1.3.6.3 is added to verify PDIL alarm circuit operability. Demonstrating the PDIL alarm circuit OPERABLE verifies that the PDIL alarm circuit is functional. The 31 day Frequency takes into account other Surveillances being performed at shorter Frequencies that identify improper CEA alignments. This change is also consistent with NUREG-1432.

14. Modifying the footnote referencing Special Test Exception 3.10.2 by adding also Special Test Exception 3.10.1 makes the applicability in MODE 2 consistent with the proposed revision to Special Test Exception 3.10.1. The proposed revision to Special Test Exception 3.10.1 will add Technical Specification 3/4.1.3.6 to the list of exceptions.

H. Specification 3/4.2.1

Description:

1. The wording "full length" is deleted from Surveillance Requirement 4.2.1.2a.

2. Footnote (1) is added to Surveillance Requirement 4.2.1.2. Footnote (1) states: "Only required to be met when the Excore Detector Monitoring System is being used to determine Linear Heat Rate."

3. Footnote (2) and (3) are added to Surveillance Requirement 4.2.1.3. Footnote (2) states: "Only required to be met when the Incore Detector Monitoring System is being used to determine Linear Heat Rate," and Footnote (3) states: "Not required to be performed below 20% RATED THERMAL POWER."

4. The wordings "when the factors" and "are appropriately included in the setting of these alarms" are deleted from Surveillance requirement 4.2.1.3b.

Justification:

1. The wording "full length" is deleted from Surveillance Requirement 4.2.1.2a since Millstone Unit No. 2 does not have part length CEAs. The use of the word "full length" is not necessary.

2. Performance of Surveillance Requirement 4.2.1.2 verifies that the Excore Detector Monitoring System can accurately monitor the Linear Heat Rate. Therefore, this Surveillance Requirement is only applicable when the Excore Detector Monitoring System is being used to determine the Linear Heat Rate.

Footnote (1) is added to provide this clarification. This change is also consistent with NUREG-1432.

3. Performance of Surveillance Requirement 4.2.1.3 verifies that the Incore Detector Monitoring System can accurately monitor Linear Heat Rate. Therefore, they are only applicable when the Incore Detector Monitoring System is being used to determine the Linear Heat Rate. Footnote (2) is added to provide this clarification. This change is also consistent with NUREG-1432.

4. The accuracy of the neutron flux information from the incore detectors is not reliable at THERMAL POWER < 20% RATED THERMAL POWER. Incore detectors are not used in Millstone Unit No. 2 to monitor Linear Heat Rate when THERMAL POWER < 20% RATED THERMAL POWER. Footnote (3) is added to clarify that performance of this surveillance is not required below 20% RATED THERMAL POWER. This change is also consistent with NUREG-1432.

5. The Millstone Unit No. 2 CORE OPERATING LIMITS REPORT states in section 2.5:

   "During operation with the linear heat rate being monitored by the Incore Detector Monitoring System, the alarm setpoints shall be adjusted to less than or equal to the limit when the following factors are appropriately included in the setting of the alarms:

   1. A measurement - calculational uncertainty factor of 1.07,

   2. An engineering uncertainty factor of 1.03, and

   3. A THERMAL POWER measurement uncertainty factor of 1.02".

   There is no need to address these factors in Surveillance Requirement 4.2.1.3b. since the CORE OPERATING LIMITS REPORT clearly addresses both the limits and the factors included in the setting of the alarms. Therefore, the wordings "when the factors" and "are appropriately included in the setting of these alarms" are deleted from Surveillance requirement 4.2.1.3b. This change is also consistent with NUREG-1432.

I. Specification 3/4.2.4

Description:

1. In the LCO the wording "shall not exceed" is replaced with "shall be ≤."

2. Action item a. is re-worded and a requirement is added to reduce THERMAL POWER to ≤ 50% of RATED THERMAL POWER within the next 4 hours if the action is not complete within the allowed outage time.

3. Action item b. is changed as follows:

   - THERMAL POWER is reduced to ≤ 50% of RATED THERMAL POWER within 2 hours instead of ≤ 20% (with no time limit specified) of the allowable THERMAL POWER level for the existing Reactor Coolant Pump combination.

   - Additional Required Action b.3. is added. This Required Action calls for restoring Azimuthal Power Tilt (T_q) to ≤ 0.02 prior to increasing THERMAL POWER, verifying T_q to be ≤ 0.02 at least once per hour for 12 hours, or until verified at 95% RATED THERMAL POWER.

4. Surveillance Requirement 4.2.4.2 is simplified by deleting 4.2.4.2.a., b. and c. and requiring T_q verification at least once every 12 hours.

Justification:

1. The wording: "shall not exceed" is replaced with "shall be ≤." The use of the mathematical symbol "≤" is consistent with the remaining text of the specification. This change is also consistent with NUREG-1432.

2. The new action item a. requires that if required actions are not met, THERMAL POWER must be reduced to ≤ 50% of RATED THERMAL POWER within 4 hours. This requirement ensures that the core is operating within its thermal limits and places the core in a more conservative condition. The interval of four hours is a reasonable time to reach 50% RATED THERMAL POWER in an orderly manner and without challenging plant systems. This change is also consistent with NUREG-1432.

3. The changes in action item b. will allow two hours to verify that the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F^T_r) is within the limit of Specification 3.2.3. Two hours are sufficient time for the operator to evaluate that this factor is within limit. If T_q ≤ 0.02 cannot be achieved, power must be reduced to ≤ 50% of RATED THERMAL POWER within 2 hours. Reducing THERMAL POWER to ≤ 50% RATED THERMAL POWER within 2 hours is sufficient to provide conservative protection from increased peaking due to potential xenon redistribution. This change is also consistent with NUREG-1432.

4. Additional Required Action b.3. is added. The required actions are modified by a note that requires all subsequent actions to be performed once power reduction commences after entering the Condition if T_q is not restored to < 0.10. This procedure ensures corrective action is taken before unrestricted power operation resumes. Following THERMAL POWER reduction to < 50% RTP, T_q must be restored to < 0.02 before THERMAL POWER is increased (Required Action b.3). This Required Action will prevent the operator from increasing THERMAL POWER above the conservative limit when the Condition, T_q outside its limits,

has existed. However, it will allow the unit to continue operation for diagnostic purposes. Required Action b.3 requires that the cause of the out of limit condition must be corrected prior to increasing THERMAL POWER. It also requires that subsequent power operation above 50% RATED THERMAL POWER may proceed provided that the measured T_q is verified < 0.02 at least once per hour for 12 hours, or until verified at 95% RATED THERMAL POWER. This ensures that the power distribution is responding as predicted. The time interval of 12 hours needed to complete the action allows sufficient time for an acceptable exit from the LCO after the T_q value is verified to be acceptable, or until 95% RATED THERMAL POWER is reached. This change is also consistent with NUREG-1432.

5. Surveillance 4.2.4.1 is changed to read: "Verify T_q is within limit at least once per 12 hours." This change eliminates any ambiguity or question concerning the operability of the Channel High Deviation Alarm. Additionally, this change requires T_q verification to be at least once per 12 hours at all times which is more conservative than the existing requirements. Surveillance Requirements 4.2.4.2.b. and c. are also deleted since these are no longer required. The tilt surveillance is normally performed using the incore detectors. Should the incore detector system be inoperable and one excore channel be inoperable, then an accurate tilt calculation cannot be performed. This change is also consistent with NUREG-1432.

J. Specification 3/4.10.1

Description:

1. The Limiting Condition For Operation is modified by deleting the wording "SHUTDOWN MARGIN," and adding the wording ",3.1.3.5 and 3.1.3.6" and "(of those CEAs actually withdrawn)."

2. Footnote (2) is added to APPLICABILITY MODE 3 and the wording "during PHYSICS TESTS" is added to APPLICABILITY.

3. The wording "full length" is deleted from action items a., b. and Surveillance Requirement 4.10.1.1.

4. The word "once" and footnote (1) are added to Surveillance Requirement 4.10.1.2.

Justification:

1. The Limiting Condition For Operation is modified by deleting the wording "SHUTDOWN MARGIN" and adding the wording ",3.1.3.5 and 3.1.3.6" to permit relaxation of Limiting Condition For Operation of Specifications 3/4.1.3.5 and 3/4.1.3.6. Exception from the requirements of these two Technical

Specifications is needed to allow the performance of certain PHYSICS TESTS. These tests are conducted to determine the control element assembly worth. The wording "(of those CEAs actually withdrawn)" is added to clarify which CEA worth is immediately available for reactivity control when CEA worth measurement tests are being performed. This change is also consistent with NUREG-1432.

2. Footnote (2) is added to APPLICABILITY MODE 3 to allow temporary entry into MODE 3 while conducting CEA worth testing in MODE 2. While performing CEA worth testing in MODE 2, sufficient negative reactivity may be inserted during the performance of these tests to result in temporary entry into MODE 3. Because the intent is to immediately return to MODE 2 to continue CEA worth measurements, the Special Test Exception allows limited operation to 6 consecutive hours in MODE 3 as indicated by the added wording, without having to borate to meet the Shutdown Margin requirements of Specification 3/4.1.1.1. This change is also consistent with NUREG-1432.

3. The clarification "during PHYSICS TESTS" is added to the APPLICABILITY. Specification 3/4.10.1 is part of Special Test Exceptions Technical Specifications and is applicable only during PHYSICS TESTS in MODES 2 and 3.

4. The wording "full length" is deleted from action items a., b. and Surveillance Requirement 4.10.1.1. Millstone Unit No. 2 does not have part length CEAs any longer. Therefore, the use of the word "full length" is not necessary.

5. The word "once" is added to Surveillance Requirement 4.10.1.2 to clarify the frequency of performing the surveillance. The intent of this specification is to demonstrate the ability of fully inserting each CEA (that is not fully inserted) only once prior to suspending the requirements of Specifications 3.1.1.1, 3.1.3.5 and 3.1.3.6.

6. Surveillance Requirement 4.10.1.2 is modified by Footnote (1) in order not to require the Surveillance Requirement to be performed during initial power escalation following a refueling outage if Surveillance Requirement 4.1.3.4 has been met during that refueling outage. This allows the CEA drop time test, which also proves the CEAs are trippable, to be credited for this Surveillance Requirement. This change is also consistent with NUREG-1432.

K. Specifications 3/4.10.3, 3/4.10.4, and 3/4.10.5

Description:

Delete all three specifications in their entirety.

Justification:

1. Delete Specification 3/4.10.3 in its entirety. Special Test Exception 3.10.3 allows the reactor to be critical for the performance of Low Power Physics Tests at low temperature and pressure conditions. This specification has not been used in many years and it is highly unlikely that it will be used in the future.

2. Delete Specification 3/4.10.4 in its entirety. Special Test Exception 3.10.4 allows the reactor to be critical for the performance of Low Power Physics Tests with less than 4 reactor coolant pumps operating (natural circulation tests). This specification has not been used in many years and it is highly unlikely that it will be used in the future.

3. Delete Specification 3/4.10.5 in its entirety. Special Test Exception 3/4.10.5 allows for the performance of Isothermal Temperature Coefficient measurements using only the center CEA to be inserted (misaligned) for reactivity control. This specification has not been used in many years and it is highly unlikely that it will be used in the future.

L. Definition 1.13, Specifications 3/4.2.3, 3/4.9.1, and 5.3.2

Description:

The wording "full length" is deleted from Definition 1.13, Specifications 3/4.2.1, 3/4.2.3, 3/4.9.1, and 5.3.2.

Justification:

Millstone Unit No. 2 does not have part length CEAs any longer. Therefore, the use of the word "full length" is not necessary.

M. Bases Changes

1. Bases 3/4.1.1.1 and 3/4.1.1.2 are modified to remove discussions associated with the existing Specification 3/4.1.1.2 which is deleted. A new Bases section 3/4.1.1.2 is added to discuss bases for the newly added Specification 3/4.1.1.2.

2. Bases 3/4.1.3 is updated to reflect the changes in Specifications 3/4.1.3.1, 3/4.1.3.3, 3/4.1.3.4, 3/4.1.3.5, and 3/4.1.3.6.

3. Bases 3/4.2.1 is updated to: a) delete the specified allowances in their entirety as the applicable allowances are specified in the Core Operating Limits Report, b) delete the statement that "Items (1) and (4) above are only applicable to fuel batches 'A' through 'L'," as there are no future core loading plans which would utilize those fuel assemblies.

4. Basis 3/4.2.3 is updated to add basis for LCO applicability in MODE 1 above 20% of RATED THERMAL POWER.

5. Bases 3/4.10.3, 3/4.10.4, and 3/4.10.5 are deleted since Specifications 3/4.10.1, 3/4.10.4 and 3/4.10.5 are deleted.

Safety Summary

DNC has evaluated the impact on plant safety and concluded that the proposed change will have no adverse effect on plant safety. The following are the details of this evaluation:

A. Specifications 3/4.1.1.1 and 3/4.1.1.2

The APPLICABILITY of the new proposed specification is limited to MODES 3, 4 and 5. This is appropriate since in MODES 1 and 2, SDM is ensured by complying with Specifications 3/4.1.3.5, "Reactivity Control Systems, Shutdown CEA Insertion Limit," and 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits." This change does not impact the requirements to maintain SDM in MODES 1 and 2 and as such, has no impact on the minimum required SDM assumed as an initial condition in the safety analyses. Therefore, this change has no adverse impact on plant safety.

Removing Specifications 4.1.1.1.1a., b. and c. and 4.1.1.2a. will not change the surveillance requirement which ensure the operability of CEAs since they are covered by other Technical Specifications. Removing Specification 4.1.1.1.2 and replacing it with a new Technical Specification 3/4.1.1.2 which addresses Core Reactivity Balance will not change the requirements of maintaining the difference between actual and predicted core reactivity balance within the specified limit. If the reactivity balance is not within the limits, the new Technical Specification requires re-evaluation of core design and the safety analyses and establish appropriate operating restrictions and surveillance requirements within 7 days. If this condition is not met the reactor shall be placed in MODE 3 within 6 hours. The new Technical Specification also requires verification of reactivity balance prior to entering MODE 1 after fuel loading and at least once every 31 Effective Full Power Days (EFPD). These requirements are more conservative than Specification 4.1.1.1.2 requirements.

B. Specifications 3/4.1.1.3, 3/4.1.1.5, 3/4.3.1.1, 3/4.3.2.1 and 3/4.4.9.1

The notes and footnotes referencing Special Test Exception 3.10.3 or 3.10.4 are removed. Technical Specifications 3/4.10.3, "Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality" and 3/4.10.4, "Special Test Exceptions, Physics Tests," are proposed to be deleted. This is consistent with the deletion of Specifications 3/4.10.3 and 3/4.10.4. This change does not affect any

Technical Specification requirements. A typographical error contained in Table 3.3-3 Action 2.a. is being corrected. This is a non technical change.

C. Specification 3/4.1.3.1

1. Revising the LCO to state the requirement on CEA operability and alignment first then the requirement on CEA Motion Inhibit operability second does not impact the requirements on operability and alignment of CEAs. An additional requirement on the operability of the CEA Deviation Circuit is added. The CEA Motion Inhibit and CEA Deviation Circuits are provided to permit CEA motion within the requirement of Specification 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits." The operability of the CEA Motion Inhibit and the CEA Deviation Circuit supports the primary requirement of the LCO. These requirements are more conservative and explicit than current Specification 3.1.3.1 requirements.

2. Reordering the action statements to address CEA operability and alignment first, then the requirement on CEA Motion Inhibit and Deviation Circuit operability second will make the actions consistent with the change in LCO as described in item 1 above. This change does not impact the action requirements and therefore has no effect on the operability and alignment of CEAs.

3. Deletion of Actions c., d. and e. which allow operation for up to 7 days in MODES 1 and 2 with one CEA inoperable (unless untrippable) or misaligned are conservative changes because these changes eliminate the undesirable small effects caused by operation for 7 days with misaligned CEA. Continued operation with reducing power for seven days even with a small misalignment results in:

   - A small effect on the time dependent long term power distributions relative to those used in generating LCOs and limiting safety system settings (LSSS) setpoints;

   - A small effect on the available SDM; and

   - A small effect on the ejected CEA worth used in the accident analyses.

   These effects, although small, are undesirable. These changes are conservative changes and have no effect on the operability and alignment of CEAs.

4. Deleting the requirements to determine SHUTDOWN MARGIN in Actions a., d.2., and e. has no impact on the minimum required SDM assumed as an initial condition in the safety analyses. The deletion of these requirements has been

approved by the NRC in Technical Specification change traveler TSTF-67[6] on August 11, 1997. The justification provided in TSTF-67 is based on the argument that the SHUTDOWN MARGIN definition and the CEA Actions requiring the verification of SHUTDOWN MARGIN force computation of SHUTDOWN MARGIN that is not reflected in the safety analyses which presume that the scram worth available is that given by the Power Dependent Insertion Limit (PDIL) at the initial power level. Such a computation of SHUTDOWN MARGIN has no direct relationship to the scram worth used in the safety analyses covering power conditions. As such, this computation can falsely and misleadingly confirm that the current condition is acceptable when, in fact, it is not.

5. Deletion of Action d.2.b. and modifying the Bases section to describe how CEA misalignment can be restored has no impact on the operability and alignment of CEAs. The deletion of these requirements has been approved by the NRC in Technical Specification change traveler TSTF-143[7] on March 14, 1997. The justification provided in TSTF-143 is based on the argument that the Action d.2.b contains details on how to restore alignment that are not required in the Actions. This information is added in the Bases which state that within 2 hours the misaligned CEA(s) must be restored to within 10 steps of its group or the misaligned CEA's group must be aligned to within 10 steps of the misaligned CEA. The Bases will clarify that aligning a shutdown CEA's group to within 10 steps of the misaligned CEA is not permitted.

6. Combining Actions d. and e. into Action A. in the proposed specification, adding additional requirement to reduce THERMAL POWER to less than 70% within 1 hour, and increasing the time allowed to restore the misalignment from 1 hour to 2 hours, have no impact on the operability and alignment of CEAs. The prerequisite of reducing THERMAL POWER to less than 70% will reduce the effects associated with CEAs misalignment on the core. Xenon redistribution in the core starts to occur as soon as a CEA becomes misaligned. Reducing THERMAL POWER ensures acceptable power distribution is maintained. This permits an increase in the time allowed to restore CEAs misalignment from 1 hour to 2 hours in Actions d. and e. The duration of 2 hours will give operators more time to restore misalignment without significant effect on the core.

7. Adding Action B.1 to verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter while working to restore CEA Motion Inhibit to OPERABLE ensures improper CEA alignments are identified before unacceptable power distribution occurs.

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(6) TSTF-67, "Correction of shutdown definition," approved on August 11, 1997.

(7) TSTF-143, "Consolidate Specification 3.1.5 Actions to Restore Misaligned CEAs," approved on March 14, 1997.

This change is a conservative change which has no effect on the operability and alignment of CEAs.

8. Adding Action C. to address the condition of an inoperable CEA Deviation Circuit ensures improper CEA alignments are identified before unacceptable power distribution occurs. This change is a conservative change which has no effect on the operability and alignment of CEAs.

9. Deleting the part of Specification 4.1.3.1.1 dealing with inoperable Deviation Circuit and/or CEA Motion Inhibit has no effect on the operability and alignment of CEAs. This part is added as actions B. and C. now address inoperable Deviation Circuit and CEA Motion Inhibit. Since the most likely condition for a CEA to become misaligned is during CEA movement, an additional surveillance requirement is added to verify indicated position within 1 hour following any CEA movement larger than 10 steps. This change is a conservative change which has no effect on the operability and alignment of CEAs.

10. Rewording of Specification 4.1.3.1.2 by replacing "determined to be OPERABLE" by "Verify CEA freedom of movement (trippability)" provides an explicit description of the aspect of inoperability to be verified. Slight modification of wording is also used in Specification 4.1.3.1.3 and Specification 4.1.3.1.4. These changes have no impact on the operability and alignment of CEAs.

D. Specification 3/4.1.3.3

1. Deleting the wording "for the existing Reactor Coolant Pump combination" in Action item b.3. does not have any impact on the operability and alignment of CEAs. Millstone Unit No. 2 can only operate in Modes 1 and 2 with four (4) Reactor Coolant Pumps (RCP) operating in accordance with Technical Specification 3/4.4.1.1. Therefore, these words are not needed.

2. Deleting the wording "except during time intervals when the Deviation Circuit is inoperable, then compare the pulse counting position indicator and the reed switch position indicator channels at least once per 4 hours" in Surveillance Requirement 4.1.3.3 does not have any impact on the operability and alignment of CEAs. This part is covered by Action item C in the revised Technical Specification 3/4.1.3.1. Therefore, this part is not needed.

E. Specification 3/4.1.3.4

1. Deleting the wording "full length (shutdown and control)" in the LCO, Surveillance and Action statement does not have any impact on the maximum CEA drop time assumed in the safety analyses, nor does it result in any technical changes to the current requirements. Millstone Unit No. 2 does not have any part length

CEAs. All the CEAs are full length. Therefore the words "full length" are not needed. Additionally, this Technical Specification is applicable to all CEAs. There is no need for the words "(shutdown and control)." Therefore, these words are deleted.

2. Deleting Action item b. does not have any impact on the maximum CEA drop time assumed in the safety analyses. Millstone Unit No. 2 can only operate in Modes 1 and 2 with four (4) RCPs operating in accordance with Technical Specification 3/4.4.1.1. Therefore, this Action item is not needed.

F. Specification 3/4.1.3.5

1. Changing the condition description in the Action statement from "With a maximum of one CEA withdrawn.." to "One or more shutdown CEAs not within limit," defines the required actions since the existing action statement does not provide the required action if more than one shutdown CEA are not within the insertion limit. The wording "except for surveillance testing pursuant to Specification 4.1.3.1.2" is removed and added, with some wording changes, as a footnote to the Applicability statement. This wording describes limitation on the applicability of this Technical Specification. Therefore, It belongs in the Applicability statement. These changes which are non-technical in nature have no impact on the Technical Specification.

2. Changing the time limit to restore CEAs position to the insertion limit from 1 hour to 2 hours has negligible impact on long term power and burnup distributions. This change does not impact the insertion limit assumed in the safety analyses. The 2 hour total completion time allows the operator adequate time to adjust the CEA(s) in an orderly manner and is consistent with the required action in Technical Specification 3.1.3.1, "Movable Control Assemblies, CEA Position."

3. Deletion of Action 3.1.3.5b. leads to a more conservative action statement. This deletion will not allow operating the reactor beyond the 2 hours allowed time to restore shutdown CEA(s) alignment (Specification 3.1.3.1 will allow power reduction to < 70% of maximum allowed THERMAL power within 1 hour and restore alignment within 2 hours).

4. Removing the wording "Prior to withdrawal of any CEAs in regulating groups during an approach to reactor criticality, and" in Surveillance Requirement 4.1.3.5 and replacing it with the wording "with any regulating CEA not fully inserted" in the Applicability statement does not change the Technical Specification. Adding this limitation to the Applicability statement will ensure that all shutdown CEAs shall be withdrawn to > 176 steps prior the withdrawal of any CEAs in the regulating groups.

G. Specification 3/4.1.3.6

1. Adding a requirement addressing the power dependent insertion limit (PDIL) alarm circuit to the LCO is a conservative change in the Technical Specification. Adding this requirement does not affect the regulating CEAs insertion limits used in the safety analyses. This requirement states that: "The power dependent insertion limit (PDIL) alarm circuit shall be OPERABLE." The PDIL alarm circuit is required to be OPERABLE for notification that the CEAs are outside the required insertion limits. When the PDIL alarm circuit is inoperable, the verification of CEA positions is increased to ensure improper CEA alignment is identified before unacceptable flux distribution occurs.

2. Relocating the part of LCO stating: "Regulating CEAs are considered to be fully withdrawn when withdrawn to at least 176 steps," to Bases section 3/4.1.3 is editorial in nature and does not affect the regulating CEAs insertion limits used in the safety analyses. This part of LCO does not represent by itself a LIMITING CONDITION OF OPERATION, It rather serves as a clarification of the definition of a fully withdrawn CEA. It is more appropriate to address this clarification in the Bases.

3. Deleting the part of LCO stating: "CEA insertion between the Long Term Steady State Insertion Limits and the Transient Insertion Limits restricted to the limits provided in the CORE OPERATING LIMITS REPORT," does not have impact on the LCO neither does it impact the regulating CEAs insertion limits used in the safety analyses. This part is already addressed under ACTIONS (conditions B. and C.) in the revised Specification 3/4.1.3.6. There is no need to have this wording as part of the LCO.

4. Deleting the wording: "except for surveillance testing pursuant to Specification 4.1.3.1.2" which is part of ACTION item a. in the current specification and adding it as footnote (2) is editorial in nature and does not affect the regulating CEAs insertion limits used in the safety analyses. This wording is actually an exception to the applicability of the LCO. It is more appropriate to delete the wording from ACTION item a. and add it as footnote (2). The wording of the footnote is modified to state: "This LCO is not applicable while performing Specification 4.1.3.1.2."

5. Imposing an ACTION completion time limit of 15 minutes in ACTION item B. is a conservative change which does not affect the regulating CEAs insertion limits used in the safety analyses. The existing specification does not specify a completion time for ACTION items b.1. and b.2. If the CEAs are inserted between the long term steady state insertion limits, the transient insertion limits for intervals > 4 hours per 24 hour period and the short term steady state insertion limits are exceeded, power peaking can develop which becomes of immediate concern. Additionally, since the CEAs can be in this condition without misalignment, penalty factors are not inserted in the core protection calculators

to compensate for the developing peaking factors. Verifying the short term steady state insertion limits are not exceeded ensures that the peaking factors that do develop are within those allowed for continued operation. The period of fifteen minutes provides adequate time for the operator to verify if the short term steady state insertion limits are exceeded. Furthermore, experience has shown that rapid power increases in areas of the core, in which the flux has been depressed, can result in fuel damage as the LHR in those areas rapidly increases. Restricting the rate of THERMAL POWER increases to < 5% Rated Thermal Power per hour within fifteen minutes, following CEA insertion beyond the long term steady state insertion limits, ensures the power transients experienced by the fuel will not result in fuel failure.

6. Deleting the wording: "except during operation pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1" in action item b. and c. does not affect the regulating CEAs insertion limits used in the safety analyses. The revised Specification 3.1.3.1 does not allow continuing operation in MODES 1 and 2 for up to 7 days with one CEA inoperable. The original Action item c. or its equivalent does not exist in the revised specification. Therefore, reference to item c. is deleted. Additionally the revised Specification 3.1.3.1 contains in Required Action A.1 the appropriate linkage between Specification 3.1.3.1 and 3.1.3.6. Therefore, reference to item d. or its equivalent is deleted.

7. The Required Action "Be in HOT STANDBY within 4 hours" is increased to 6 hours. This is consistent with Specification 3.0.3.

8. Adding Condition and Required Action D. to the revised Technical Specification in order to address PDIL alarm circuit operability and deleting the wording "except during time intervals when the PDIL alarm is inoperable, then verify the individual CEA positions at least once per 4 hours" in Specification 4.1.3.6 does not change the Technical Specification nor does it affect the regulating CEAs insertion limits used in the safety analyses. It is more appropriate to remove this condition and associated required action from the existing Surveillance Requirement 4.1.3.6 and to add it as Condition and Required Action D. in the revised specification.

9. Dividing Specification 4.1.3.6 in the revised specification into Specifications 4.1.3.6.1 and 4.1.3.6.2 to be consistent with the Required Actions does not change the Technical Specification nor does it affect the regulating CEAs insertion limits used in the safety analyses.

10. Adding the new Specification 4.1.3.6.3 to verify PDIL alarm circuit operability is a conservative change which enhances equipment availability and reliability. This change does not change the Technical Specification nor does it affect the regulating CEAs insertion limits used in the safety analyses. Demonstrating the PDIL alarm circuit OPERABLE verifies that the PDIL alarm circuit is functional.

The 31 day Frequency takes into account other Surveillances being performed at shorter Frequencies that identify improper CEA alignments.

H. Specification 3/4.2.1

Deleting the wording "full length" from Surveillance Requirement 4.2.1.2a., adding footnotes (1), (2) and (3) to Surveillance Requirements 4.2.1.2 and 4.2.1.3, and deleting the wordings "when the factors" and "are appropriately included in the setting of these alarms" from Surveillance Requirement 4.2.1.3b. do not affect the Surveillance Requirements nor do these changes impact the Linear Heat Rate limit used in the Safety Analyses.

I. Specification 3/4.2.4

1. Rewording Action item a. does not affect the Technical Specification neither does it impact the Azimuthal Power Tilt limit used in the accident analysis.

2. Adding a new action item a.3. which requires reducing THERMAL POWER to $\leq$ 50% of RATED THERMAL POWER within 4 hours if action item a. is not met, ensures that the core is operating within its thermal limits and places the core in a conservative condition. The interval of four hours is a reasonable time to reach 50% RATED THERMAL POWER in an orderly manner and without challenging plant systems. This change does not affect the Technical Specification neither does it impact the Azimuthal Power Tilt limit used in the accident analysis.

3. Changing Action item b. in current specification to include:

   - reduction in THERMAL POWER to $\leq$ 50% of RATED THERMAL POWER within 2 hours instead of $\leq$ 20% (with no time limit specified) of the allowable THERMAL POWER level for the existing Reactor Coolant Pump combination;

   - adding Required Action b.3. to restore T_q to $\leq$ 0.02 prior to increasing THERMAL POWER, verify T_q to be $\leq$ 0.02 at least once per hour for 12 hours, or until verified at 95% RATED THERMAL POWER;

   is a conservative change which does not affect the Technical Specification neither does it impact the Azimuthal Power Tilt limit used in the accident analysis. The changes in action item b. will allow two hours to verify that the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR is within the limit of Specification 3.2.3. Two hours are sufficient time for the operator to evaluate that this factor is within limit. If $T_q \leq 0.02$ cannot be achieved, power must be reduced to $\leq$ 50% of RATED THERMAL POWER within 2 hours. Reducing THERMAL POWER to $\leq$ 50% RATED THERMAL POWER within 2 hours is sufficient to provide conservative protection from increased peaking due to potential xenon redistribution.

4. Deleting Surveillance Requirement 4.2.4.2.a., b., and c. and requiring T_q verification at least once every 12 hours is a conservative change which does not affect the Technical Specification neither does it impact the Azimuthal Power Tilt limit used in the accident analysis. This change eliminates any ambiguity or question concerning the operability of the Channel High Deviation Alarm.

J. Specification 3/4.10.1

1. Modified the Limiting Condition For Operation by deleting the wording "SHUTDOWN MARGIN," and adding the wording ",3.1.3.5 and 3.1.3.6" and "(of those CEAs actually withdrawn)" permit relaxation of Limiting Condition For Operation of Specifications 3/4.1.3.5 and 3/4.1.3.6. This change does not impact the initial conditions input to the accident analysis. Specification 3/4.10.1 is part of Special Test Exceptions Technical Specifications and is applicable only during PHYSICS TESTS in MODES 2 and 3.

2. Adding the footnote (2) and the clarification "during PHYSICS TESTS" to the APPLICABILITY are conservative changes which do not affect the Technical Specification neither does it impact the initial conditions input to the accident analysis. Specification 3/4.10.1 is part of Special Test Exceptions Technical Specifications and is applicable only during PHYSICS TESTS in MODES 2 and 3.

3. Deleting the wording "full length" from action items a., b. and Surveillance Requirement 4.10.1.1 does not affect the Technical Specification neither does it impact the initial conditions input to the accident analysis. Millstone Unit No. 2 does not have part length CEAs. Therefore, the use of the word "full length" is not necessary.

4. Adding the word "once" and footnote (1) to Surveillance Requirement 4.10.1.2 to clarify the frequency and condition of performing the surveillance does not affect the Technical Specification neither does it impact the initial conditions input to the accident analysis. The intent of this specification is to demonstrate the ability of fully inserting each CEA (that is not fully inserted) only once within 7 days prior to suspending the requirements of Specifications 3.1.1.1, 3.1.3.5 and 3.1.3.6.

K. Specifications 3/4.10.3, 3/4.10.4, and 3/4.10.5

10 CFR 50.36c(2)(ii) contains the requirements for items that must be in Technical Specifications. This regulation provides four (4) criteria that can be used to determine the requirements that must be included in the Technical Specifications.

Specifications 3/4.10.3, 3/4.10.4 and 3/4.10.5 are deleted in their entirety. Special Test Exception 3.10.3 allows the reactor to be critical for the performance of Low Power Physics Tests at low temperature and pressure conditions. Special Test Exception 3.10.4 allows the reactor to be critical for the performance of Low Power

Physics Tests with less than 4 reactor coolant pumps operating (natural circulation tests). Special Test Exception 3/4.10.5 allows for the performance of Isothermal Temperature Coefficient measurements using only the center CEA to be inserted (misaligned) for reactivity control. These specifications have not been used in many years and it is highly unlikely that they will be used in the future. Furthermore, these Technical Specifications do not satisfy any of the 10 CFR 50.36c(2)(ii) criteria as discussed below. Therefore, these specifications are deleted.

Criterion 1 - Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Special Test Exception 3.10.3 allows the reactor to be critical for the performance of Low Power Physics Tests at low temperature and pressure conditions. Special Test Exception 3.10.4 allows the reactor to be critical for the performance of Low Power Physics Tests with less than 4 reactor coolant pumps operating (natural circulation tests). Special Test Exception 3.10.5 allows for the center CEA to be misaligned for moderator temperature coefficient and power coefficient measurements. These Technical Specifications do not cover installed instrumentation that is used to detect, and indicate in the control room, a significant degradation of the reactor coolant pressure boundary. These specifications do not satisfy criterion 1.

Criterion 2 - A process variable, design feature, or operating restriction that is an initial condition of a Design Basis Accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

These Technical Specifications do not cover a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. These specifications do not satisfy criterion 2.

Criterion 3 - A structure, system, or component (SSC) that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

These Technical Specifications do not cover a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. These specifications do not satisfy criterion 3.

Criterion 4 - A SSC which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The operating restrictions suspended by these Technical Specifications have not been shown to be risk significant to public health and safety by either operating experience or probabilistic safety assessment. These specifications do not satisfy criterion 4.

N. Definition 1.13, Specifications 3/4.2.1, 3/4.2.3, 3/4.9.1, and 5.3.2

Deleting the words "full length" in Definition 1.13, Specifications 3/4.2.1, 3/4.2.3, 3/4.9.1, and 5.3.2 does not have any impact on the assumptions used in the safety analysis. Millstone Unit No. 2 does not have any part length CEAs. All the CEAs are full length. Therefore the words "full length" are not needed.

Conclusion

The proposed changes to the Technical Specifications and Bases will not adversely affect the availability or operation of the equipment used to mitigate the design basis accidents. There will be no adverse effect on plant operation. The plant response to the design basis accidents will not change. The proposed changes are consistent with industry/NRC guidance contained in NUREG-1432. Therefore, there will be no adverse impact on public health and safety. Thus, the proposed changes are safe.

Docket No. 50-336
B18724

Attachment 2

Millstone Nuclear Power Station, Unit No. 2

Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems,
Power Distribution Limits, And Special Test Exceptions
Significant Hazards Consideration

Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems, Power Distribution Limits, And Special Test Exceptions
Significant Hazards Consideration

Description of License Amendment Request

Dominion Nuclear Connecticut, Inc. (DNC) hereby proposes to revise Millstone Unit No. 2 Technical Specifications as described in this License Amendment Request. The proposed changes are associated with Technical Specifications related to Reactivity Control Systems, Power Distribution Limits, and Special Test Exceptions.

The proposed amendment will address changes in Technical Specifications related to Reactivity Control Systems, Power Distribution Limits, and Special Test Exceptions. The proposed changes affect Definition 1.13, SHUTDOWN MARGIN, Technical Specifications 3/4.1.1.1, "Reactivity Control Systems, Shutdown Margin - T_{avg} > 200 °F," 3/4.1.1.2, "Reactivity Control Systems, Shutdown Margin - $T_{avg} \leq$ 200 °F," 3/4.1.1.3, "Reactivity Control Systems, Boron Dilution", 3/4.1.1.5, "Reactivity Control Systems, Minimum Temperature For Criticality," 3/4.1.3.1, "Reactivity Control Systems, Movable Control Assemblies, Full Length CEA Position," 3/4.1.3.3, "Reactivity Control Systems, Position Indicator Channels," 3/4.1.3.4, "Reactivity Control Systems, CEA Drop Time," 3/4.1.3.5, "Reactivity Control Systems, Shutdown CEA Insertion Limits," 3/4.1.3.6, "Reactivity Control Systems, Regulating CEA Insertion Limits," 3/4.2.1, "Power Distribution Limits, Linear Heat Rate," 3/4.2.3, "Power Distribution Limits, Total Unrodded Integrated Radial Peaking Factor - F^T_r," 3/4.2.4, "Power Distribution Limits, Azimuthal Power Tilt - T_q," 3/4.3.1.1, "Reactor Protective Instrumentation," 3/4.3.2.1, "Engineered Safety Feature Actuation System Instrumentation," 3/4.4.9, "Reactor Coolant System, Pressure/Temperature Limits," 3/4.9.1, "Refueling Operations, Boron Concentrations," 3/4.10.1, "Special Test Exceptions, Shutdown Margin," 3/4.10.3, "Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality," 3/4.10.4, "Special Test Exceptions, Physics Tests," 3/4.10.5, "Special Test Exceptions, Center CEA Misalignment," and 5.3.2, "Design Features, Control Element Assemblies." The corresponding Index pages and Bases sections will also be revised to reflect these changes.

Technical Specification changes

- Specifications 3/4.1.1.1, "Reactivity Control Systems, Shutdown Margin - T_{avg} > 200 °F," and 3/4.1.1.2, "Reactivity Control Systems, Shutdown Margin - $T_{avg} \leq$ 200 °F," are combined as Specification 3/4.1.1.1. The APPLICABILITY is changed to "MODES 3, 4 and 5". Specification 4.1.1.1.2 which addresses Core Reactivity Balance is removed. A new Technical Specification 3/4.1.1.2 is added to address Core Reactivity Balance.

  Changes in Specification 3/4.1.1.3, 3/4.1.1.5, 3/4.3.1.1, 3/4.3.2.1 and 3/4.4.9.1 include deleting the notes and footnotes referencing Special Test Exception 3.10.3

or 3.10.4 since Technical Specifications 3/4.10.3, "Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality" and 3/4.10.4, "Special Test Exceptions, Physics Tests," are proposed to be deleted. A typographical error contained in Table 3.3-3 Action 2.a. is being corrected. This is a non technical change.

- Changes in Specification 3/4.1.3.1 include adding requirement on the operability of the CEA Deviation Circuit, deleting action c., and modifying actions a., d., and e. The time allowed to restore the misalignment in Actions d and e is increased from 1 hour to 2 hours. Additional requirements are added to reduce THERMAL POWER to less than 70% within 1 hour, verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter while working to restore CEA Motion Inhibit to OPERABLE, and to address the condition of an inoperable CEA Deviation Circuit.

- Changes in Specification 3/4.1.3.3 include deleting reference to the RCP combination used and part of Surveillance Requirement 4.1.3.3 addressing operability of the Deviation Circuit.

- Changes in Specification 3/4.1.3.4 include deleting the wording "full length" and Action item b.

- Changes in Specification 3/4.1.3.5 include changing time limit to restore CEAs position to the insertion limit from 1 hour to 2 hours, and deleting Action 3.1.3.5b.

- Changes in Specification 3/4.1.3.6 include adding an additional requirement on the power dependent insertion limit (PDIL) alarm circuit operability, wording changes in the LCO, Action items a., b., c. and d., adding Action item D. and new Specification 4.1.3.6.3 to address PDIL alarm circuit operability, and wording changes in the other surveillance requirements.

- Changes in Specification 3/4.2.1 include deleting the wording "full length" from Surveillance Requirement 4.2.1.2a, adding footnotes (1), (2) and (3) to Surveillance Requirements 4.2.1.2 and 4.2.1.3, and deleting the wordings "when the factors" and "are appropriately included in the setting of these alarms" from Surveillance requirement 4.2.1.3b.

- Changes in Specification 3/4.2.4 include adding new action item A.3, rewording action item b., and deleting Surveillance Requirements 4.2.4.2a., b., and c.

- Changes in Specification 3/4.10.1 include deleting the wording "SHUTDOWN MARGIN," and adding the wording ",3.1.3.5 and 3.1.3.6" and "(of those CEAs actually withdrawn)" in the Limiting Condition For Operation, adding footnote (2) and clarification to the APPLICABILITY statement, deleting the wording "full length" from action items a., b. and Surveillance Requirement 4.10.1.1, and adding the word "once" and footnote (1) to Surveillance Requirement 4.10.1.2.

- Specifications 3/4.10.3, 3/4.10.4, and 3/4.10.5 are deleted.

- Changes in Definition 1.13, Specifications 3/4.2.1, 3/4.2.3, 3/4.9.1, and 5.3.2 include deleting the words "full length."

Basis for No Significant Hazards Consideration

In accordance with 10 CFR 50.92, DNC has reviewed the proposed changes and has concluded that they do not involve a Significant Hazards Consideration (SHC). The basis for this conclusion is that the three criteria of 10 CFR 50.92(c) are not compromised. The proposed changes do not involve an SHC because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed Technical Specification changes associated with the deletion of special test exceptions in Specifications 3/4.10.3, 3/4.10.4 and 3/4.10.5, changes to reflect the current Millstone Unit No. 2 design (i.e. full length CEAs), changes that limit the Mode applicability requirement for Shutdown Margin requirements (Specifications 3/4.1.1.1 and 3/4.1.1.2), and changes to action requirements and surveillance requirements will not cause an accident to occur and will not result in any change in operation of the mitigation equipment. The proposed changes in Specification 3/4.1.3.1 have no effect on the operability and alignment of CEAs. The proposed allowed outage times and shutdown times are reasonable and consistent with the industry guidelines to ensure the accident mitigation equipment will be restored in a timely manner. In addition the design basis accident will remain the same postulated events described in the Millstone Unit No. 2 Final Safety Analysis Report. Since the initial conditions and assumptions included in the safety analyses are unchanged, the consequences of the postulated events remain unchanged. Therefore the proposed changes will not increase the probability or consequences of an accident previously evaluated.

   The additional proposed changes to the Technical Specifications (e.g. combining requirements, re-ordering requirements, relocating information to the Bases, modifying index pages, deletion or addition of footnotes) will not result in any technical changes to the current requirements. Therefore, these additional changes will not increase the probability or consequences of an accident previously evaluate.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed changes do not alter the plant configuration (no new or different type of equipment will be installed) or require any new or unusual operator actions. Since the requirements remain the same, the proposed changes do not

alter the way any system, structure, or component functions and do not alter the manner in which the plant is operated. The proposed changes do not introduce any new failure modes. Therefore, the proposed changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Involve a significant reduction in a margin of safety.

The proposed changes will not reduce the margin of safety since they have no impact on any accident analysis assumptions. The proposed changes do not decrease the scope of equipment currently required to operate or subject to surveillance testing, nor do the proposed changes affect any instrument setpoints or equipment safety functions. The effectiveness of Technical Specifications will be maintained since the changes will not alter the operation of any component or system, nor will the proposed changes affect any safety limits or safety system settings which are credited in a facility accident analysis. Therefore, there is no reduction in a margin of safety.

Docket No. 50-336
B18724

Attachment 3

Millstone Nuclear Power Station, Unit No. 2

Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems,
Power Distribution Limits, And Special Test Exceptions
Marked Up Pages

List of Affected Pages

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Index Page IX		Amend. No. 249
Index Page X		Amend. No. 250
Index Page XIV		Amend. No. 250
1.0	Definitions	1-3, Amend No. 263
3/4 1.1 1	Reactivity Control Systems, Shutdown Margin - $T_{avg} > 200$ °F	3/4 1-1, Amend No 148 3/4 1-2, Amend. No. 216
3/4.1.1.2	Reactivity Control Systems, Shutdown Margin - $T_{avg} \leq 200$ °F	3/4 1-3, Amend. No. 148
3/4 1 1.3	Reactivity Control Systems, Boron Dilution	3/4 1-4, Amend. No. 215
3/4 1.1.5	Reactivity Control Systems, Minimum Temperature For Criticality	3/4 1-7, Amend. No. 24
3/4.1 3 1	Reactivity Control Systems, Movable Control Assemblies, Full Length CEA Position	3/4 1-20, Amend. No. 32 3/4 1-21, Amend. No. 148 3/4 1-22, Amend No. 253
3/4.1 3 3	Reactivity Control Systems, Position Indicator Channels	3/4 1-24, Amend. No. 36 3/4 1-25, Amend No 151
3/4 1.3 4	Reactivity Control Systems, CEA Drop Time	3/4 1-26, Amend No. 216
3/4.1.3 5	Reactivity Control Systems, Shutdown CEA Insertion Limits	3/4 1-27, Original issue
3/4 1.3 6	Reactivity Control Systems, Regulating CEA Insertion Limits	3/4 1-28, Amend No. 153 3/4 1-29, Amend. No 216
3/4 2 1	Power Distribution Limits, Linear Heat Rate	3/4 2-2, Amend. No. 148
3/4.2 3	Power Distribution Limits, Total Unrodded Integrated Radial Peaking Factor	3/4 2-9, Amend. No 230
3/4 2.4	Power Distribution Limits, Azimuthal Power Tilt - T_q	3/4 2-10, Amend. No. 155 3/4 2-11, Original issue
3/4.3 1.1	Table 3 3-1, Reactor Protective Instrumentation	3/4 3-2, Amend. No. 225 3/4 3-3, Amend No. 52 3/4 3-4, Amend No. 226
3/4.3.2 1	Table 3 3-3, Engineered Safety Feature Actuation System Instrumentation	3/4 3-12, Amend. No. 227 3/4 3-16, Amend. No. 227
3/4 4.9	Reactor Coolant System, Pressure/ Temperature Limits	3/4 4-17, Amend No 218
3/4 9.1	Refueling Operations, Boron Concentrations	3/4 9-1, Amend. No 263
3/4.10.1	Special Test Exceptions, Shutdown Margin	3/4 10-1, Amend. No 154
3/4 10.3	Special Test Exceptions, Pressure/ Temperature Limitation - Reactor Criticality	3/4 10-3, Amend. No. 218
3/4.10.4	Special Test Exceptions, Physics Tests	3/4 10-4, Original issue
3/4 10 5	Special Test Exceptions, Center CEA Misalignment	3/4 10-5, Amend. No. 250
5 0	Design Features	5-4, Amend. No. 216
3/4.1.1.1 and 3/4.1.1.2 Bases	Shutdown Margin	B 3/4 1-1, Amend No. 185

List of Affected Pages

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Technical Specification Section Number	Title of Section	Affected Page with Amendment Number
3/4.1.3 Bases	Movable Control Assemblies	B 3/4 1-3a, Amend. No 218 B 3/4 1-4, Amend. No. 139 B 3/4 1-4a, Amend. No. 216 B 3/4 1-5, Amend No. 216
3/4 2.1 Bases	Linear heat Rate	B 3/4 2-1, Amend. No. 230 B 3/4 2-2, Amend No. 230
3/4 10.3, 3/4.10.4 and 3/4 10.5 Bases	Special Test Exceptions, Pressure/Temperature Limitation - Reactor Criticality, Physics Tests, Center CEA Misalignment	B 3/4 10-1, Amend. No 5

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION

LIMITING CONDITION FOR OPERATION AND SURVEILLANCE REQUIREMENTS

BASES

DELETED

DEFINITIONS

CORE ALTERATION

1.12 CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

SHUTDOWN MARGIN

1.13 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming all ~~full length~~ control element assemblies (shutdown and regulating) are fully inserted except for the single assembly of highest reactivity worth which is assumed to be fully withdrawn.

IDENTIFIED LEAKAGE

1.14 IDENTIFIED LEAKAGE shall be:

a. Leakage into closed systems, such as pump seal or valve packing leaks that are captured, and conducted to a sump or collecting tank, or

b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be PRESSURE BOUNDARY LEAKAGE.

UNIDENTIFIED LEAKAGE

1.15 UNIDENTIFIED LEAKAGE shall be all leakage which is not IDENTIFIED LEAKAGE or CONTROLLED LEAKAGE.

PRESSURE BOUNDARY LEAKAGE

1.16 PRESSURE BOUNDARY LEAKAGE shall be leakage (except steam generator tube leakage) through a non-isolable fault in a Reactor Coolant System component body, pipe wall or vessel wall.

CONTROLLED LEAKAGE

1.17 CONTROLLED LEAKAGE shall be the water flow from the reactor coolant pump seals.

Replace with insert TS 3111

October 12, 1990

3/4.1 REACTVITY CONTROL SYSTEMS

3/4.1.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN - T_{avg} > 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be within the limit specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1, 2*, 3 and 4

ACTION:

With the SHUTDOWN MARGIN outside the limit specified in the CORE OPERATING LIMITS REPORT, within 15 minutes initiate and continue boration at ≥ 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the required SHUTDOWN MARGIN is reached.

SURVEILLANCE REQUIREMENT

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be within the limit specified in the CORE OPERATING LIMITS REPORT:

a. Immediately upon detection of an inoperable CEA. If the inoperable CEA is immovable or untrippable, the SHUTDOWN MARGIN, required by Specification 3.1.1.1, shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable CEA.

b. When in MODES 1 OR 2, at least once per 12 hours by verifying that CEA group withdrawal is within the Transient Insertion Limits of Specification 3.1.3.6.

c. Prior to initial operation above 5% RATED THERMAL POWER after each refueling, with the CEA groups at the Transient Insertion Limits of Specification 3.1.3.6.

~~*See Special Test Exception 3.10.1~~

SURVEILLANCE REQUIREMENTS (Continued)

d. When in MODES 3 or 4, at least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. CEA position,
3. Reactor coolant temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration, and
6. Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement with ± 1.0% Δk/k at least once per 31 Effective Full Power Days. This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.d, above. The predicted reactivity values may be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each refueling.

(1)

Replace with

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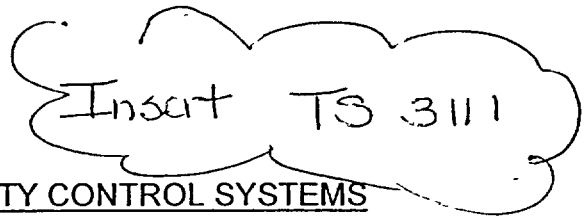

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN (SDM)

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be within the limit specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 3[(1)], 4 and 5.

ACTION:

With the SHUTDOWN MARGIN not within the limit specified in the CORE OPERATING LIMITS REPORT, within 15 minutes, initiate and continue boration at $\geq$ 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the SHUTDOWN MARGIN is restored to within limit.

SURVEILLANCE REQUIREMENT

4.1.1.1 Verify SHUTDOWN MARGIN is within the limit specified in the CORE OPERATING LIMITS REPORT at least once every 24 hours.

(1) See Special Test Exception 3.10.1

REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN - $T_{avg} \leq 200°F$

LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be within the limit specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 5.

ACTION:

With the SHUTDOWN MARGIN outside the limit specified in the CORE OPERATING LIMITS REPORT, within 15 minutes initiate and continue boration at $\geq$ 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The SHUTDOWN MARGIN shall be determined to be within the limit specified in the CORE OPERATING LIMITS REPORT:

a. Immediately upon detection of an inoperable CEA. If the inoperable CEA is immovable or untrippable, the SHUTDOWN MARGIN required by Specification 3.1.1.2 shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable CEA.

b. At least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. CEA position,
3. Reactor coolant temperature,
4. Fuel burnup based on gross thermal energy generation.
5. Xenon concentration, and
6. Samarium concentration.

Replace with Insert TS 3112

Insert TS 3112

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 REACTIVITY CONTROL SYSTEMS

Reactivity Balance

LIMITING CONDITION FOR OPERATION

3.1.1. 2 The core reactivity balance shall be within ± 1% Δk/k of predicted values.

APPLICABILITY: MODES 1 and 2.

ACTION

With core reactivity balance not within limit:

Re-evaluate core design and safety analysis and determine that the reactor core is acceptable for continued operation and establish appropriate operating restrictions and Surveillance Requirements within 7 days or otherwise be in MODE 3 within the next 6 hours.

SURVEILLANCE REQUIREMENT

4.1.1. 2 Verify[1] overall core reactivity balance is within ±1% Δk/k of predicted values prior to entering MODE 1 after fuel loading and at least once every 31 Effective Full Power Days[2]. The provisions of Specification 4.0.4 are not applicable.

(1) The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

(2) Only required after 60 Effective Full Power Days.

~~May 26, 1998~~

REACTIVITY CONTROL SYSTEMS

BORON DILUTION

LIMITING CONDITION FOR OPERATION

3.1.1.3 The flow rate of reactor coolant through the core shall be ≥ 1000 gpm whenever a reduction in Reactor Coolant System boron concentration is being made.

APPLICABILITY: ALL MODES.

ACTION:

With the flow rate of reactor coolant through the core < 1000 gpm, immediately suspend all operations involving a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.1.1.3* The reactor coolant flow rate through the core shall be determined to be ≥ 1000 gpm prior to the start of and at least once per hour during a reduction in the Reactor Coolant System boron concentration by either:

a. Verifying at least one reactor coolant pump is in operation, or

b. Verifying that at least one low pressure safety injection pump is in operation and supplying ≥ 1000 gpm through the core.

*When the plant is in MODE 1 or 2, reactor coolant pumps are required to be in operation. Therefore, Surveillance Requirement 4.1.1.3 does not have to be performed in MODES 1 and 2. ~~This exception does not apply if operating in accordance with Special Test Exception 3.10.4.~~

~~June 24, 1977~~

REACTIVITY CONTROL SYSTEMS

MINIMUM TEMPERATURE FOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.1.1.5 The Reactor Coolant System temperature (T_{avg}) shall be $\geq$ 515°F when the reactor is critical.

APPLICABILITY: MODES 1 and 2*#.

ACTION:

With the Reactor Coolant System temperature (T_{avg}) < 515°F, restore T_{avg} to within its limit within 15 minutes or be in HOT STANDBY within the next 15 minutes. 24

SURVEILLANCE REQUIREMENTS

4.1.1.5 The Reactor Coolant System temperature (T_{avg}) shall be determined to be $\geq$ 515°F:

a. Within 15 minutes prior to making the reactor critical, and

b. At least once per hour when the reactor is critical and the Reactor Coolant System temperature (T_{avg}) is < 525°F.

* ~~See Special Test Exception 3.10.3~~

With $K_{eff} \geq 1.0$.

~~April 19, 1978~~

Replace with Insert TS3131-1

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

FULL LENGTH CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 The CEA Motion Inhibit and all full length (shutdown and regulating) CEAs shall be OPERABLE with each CEA of a given group positioned within 10 steps (indicated position) of all other CEAs in its group. 32

APPLICABILITY: MODES 1* and 2*.

ACTION:

a. With one or more full length CEAs inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in at least HOT STANDBY within 6 hours.

b. With the CEA Motion Inhibit inoperable, within 6 hours either: 32

1. Restore the CEA Motion Inhibit to OPERABLE status, or

2. Place and maintain the CEA drive system mode switch in either the "Manual" or "Off" position and fully withdraw all CEAs in group 7 to less than 5% insertion, or

3. Be in at least HOT STANDBY.

c. With one full length CEA inoperable (unless immovable as a result of excessive friction or mechanical interference or known to be untrippable) but within its above specified alignment requirements, operation in MODES 1 and 2 may continue for up to 7 days per occurrence with a total accumulated time of $\leq$ 14 days per calendar year.

d. With one or more full length CEAs misaligned from any other CEAs in its group by more than 10 steps but less than 20 steps, operation in MODES 1 and 2 may continue, provided that within one hour the misaligned CEA(s) is either: 32 32

*See Special Test Exceptions 3.10.2 and 3.10.5.

replace with Insert TS 3131-2

~~October 12, 1990~~

REACTIVITY CONTROL SYSTEMS

ACTION (Continued):

1. Restored to OPERABLE status within its above specified alignment requirements, or

2. Declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue for up to 7 days per occurrent with a total accumulated time of ≤ 14 days per calendar year provided all of the following conditions are met:

   a.) The THERMAL POWER level shall be reduced to ≤ 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination within one hour; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used.

   b.) Within one hour after reducing the THERMAL POWER as required by a), above, the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 10 steps of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

   c.) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

e. With one full length CEA misaligned from any other CEA in its group by 20 steps or more, reduce THERMAL POWER to ≤ 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination within one hour; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Within one hour after reducing THERMAL POWER as required above, either:

   1. Restore the CEA to within the above specified alignment requirements, or

   2. Declare the CEA inoperable and determine that the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, POWER OPERATION may continue for up to 7 days per occurrence with a total ccumulated time of ≤ 14 days per calendar year provided the remainder of the CEAs in the group with the inoperable CEA are aligned to within 10 steps of the inoperable CEA

REACTIVITY CONTROL SYSTEMS

ACTION (Continued):

while maintaining the allowable CEA sequence and insertion limits of Specification 3.1.3.6 and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

f. With more than one full length CEA inoperable or misaligned from any other CEA in its group by 20 steps (indicated position) or more, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length CEA shall be determined to be within 10 steps (indicated position) of all other CEAs in its group at least once per 12 hours except during time intervals when the Deviation Circuit and/or CEA Motion Inhibit are inoperable, then verify the individual CEA positions at least once per 4 hours.

4.1.3.1.2 Each full length CEA not fully inserted shall be determined to be OPERABLE by movement of at least 10 steps at least once per 92 days. (1) de

4.1.3.1.3 The CEA Motion Inhibit shall be demonstrated OPERABLE at least once per 92 days by a functional test of the CEA group deviation circuit which verifies that the circuit prevents any CEA from being misaligned from all other CEAs in its group by more than 10 steps (indicated position). (1) de

4.1.3.1.4 The CEA Motion Inhibit shall be demonstrated OPERABLE by a functional test which verifies that the circuit maintains the CEA group overlap and sequencing requirements of Specification 3.1.3.6 and that the circuit prevents the regulating CEAs from being inserted beyond the Transient Insertion Limits of Specification 3.1.3.6:

a. Prior to each entry into MODE 2 from MODE 3, except that such verification need not be performed more often than once per 31 days, and

b. At least once per 6 months.

Replace with

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REACTIVITY CONTROL SYSTEMS

Insert TS 3131-1

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 All CEAs shall be OPERABLE and aligned to within 10 steps (indicated position) of their respective group, and the CEA Motion Inhibit and the CEA Deviation Circuit shall be OPERABLE.

APPLICABILITY: MODES 1[1] and 2[1].

ACTION:

INOPERABLE EQUIPMENT	REQUIRED ACTION
A. One or more CEAs trippable and misaligned from its group by > 10 steps and < 20 steps. OR One CEA trippable and misaligned from its group by > 20 steps.	A.1 Reduce THERMAL POWER to < 70% of the maximum allowable THERMAL POWER within 1 hour and restore CEA(s) misalignment within 2 hours or otherwise be in MODE 3 within the next 6 hours.
B. CEA Motion Inhibit inoperable.	B.1 Verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter, and restore CEA Motion Inhibit to OPERABLE status within 6 hours or otherwise be in MODE 3 within the next 6 hours. OR B.2[2] Place and maintain the CEA drive system mode switch in either the "off" or "manual" position, and withdraw all CEAs in group 7 to ≥172 steps within 6 hours or otherwise be in MODE 3 within the next 6 hours.
C. CEA Deviation Circuit inoperable.	C.1 Verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter or otherwise be in MODE 3 within the next 6 hours.

1 See Special Test Exception 3.10.2

2 Performance of Action B.2 is allowed only when not in conflict with either Required Action A.1 or C.1.

Insert TS 3131-2

REACTIVITY CONTROL SYSTEMS

ACTION (Continued):

D. One or more CEAs untrippable. OR Two or more CEAs misaligned by > 20 steps.	D.1 Be in MODE 3 within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 Verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group at least once per 12 hours AND within 1 hour following any CEA movement larger than 10 steps.

4.1.3.1.2 Verify CEA freedom of movement (trippability) by moving each individual CEA that is not fully inserted into the reactor core 10 steps in either direction at least once per 92 days.

4.1.3.1.3 Verify the CEA Deviation Circuit is OPERABLE at least once per 92 days by a functional test of the CEA group Deviation Circuit which verifies that the circuit prevents any CEA from being misaligned from all other CEAs in its group by more than 10 steps (indicated position).

4.1.3.1.4 Verify the CEA Motion Inhibit is OPERABLE by a functional test which verifies that the circuit maintains the CEA group overlap and sequencing requirements of Specification 3.1.3.6 and that the circuit prevents regulating CEAs from being inserted beyond the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT:

a. Prior to each entry into MODE 2 from MODE 3, except that such verification need not be performed more often than once per 31 days, and
b. At least once per 6 months.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.3 All shutdown and regulating CEA reed switch position indicator channels and CEA pulse counting position indicator channels shall be OPERABLE and capable of determining the absolute CEA positions within ± 3 steps.

Ch. 36

APPLICABILITY: MODES 1 and 2.

ACTION:

a. Deleted.

b. With a maximum of one reed switch position indicator channel per group or one (except as permitted by ACTION item d. below) pulse counting position indicator channel per group inoperable and the CEA(s) with the inoperable position indicator channel partially inserted, within 4 hours either:

1. Restore the inoperable position indicator channel to OPERABLE status, or

2. Be in HOT STANDBY, or

3. Reduce THERMAL POWER to < 70% of the maximum allowable THERMAL POWER level ~~for the existing Reactor Coolant Pump combination~~; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Operation at or below this reduced THERMAL POWER level may continue provided that within the next 4 hours either:

a) The CEA group(s) with the inoperable position indicator is fully withdrawn while maintaining the withdrawal sequence required by Specification 3.1.3.6 and when this CEA group reaches its fully withdrawn position, the "Full Out" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully withdrawn. Subsequent to fully withdrawing this CEA group(s), the THERMAL POWER level may be returned to a level consistent with all other applicable specifications; or

(c)

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS (Continued)

LIMITING CONDITION FOR OPERATION (Continued)

b) The CEA group(s) with the inoperable indicator is fully inserted, and subsequently maintained fully inserted, while maintaining the withdrawal sequence and THERMAL POWER level required by Specification 3.1.3.6 and when this CEA group reaches its fully inserted position, the "Full In" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully inserted. Subsequent operation shall be within the limits of Specification 3.1.3.6.

4. If the failure of the position indicator channel(s) is during STARTUP, the CEA group(s) with the inoperable position indicator channel must be moved to the "Full Out" position and verified to be fully withdrawn via a "Full Out" indicator within 4 hours.

c. With a maximum of one reed switch position indicator channel per group or one pulse counting position indicator channel per group inoperable and the CEA(s) with the inoperable position indicator channel at either its fully inserted position or fully withdrawn position, operation may continue provided:

1. The position of this CEA is verified immediately and at least once per 12 hours thereafter by its "Full In" or "Full Out" limit (as applicable).

2. The fully inserted CEA group(s) containing the inoperable position channel is subsequently maintained fully inserted, and

3. Subsequent operation is within the limits of Specification 3.1.3.6.

d. With one or more pulse counting position indicator channels inoperable, operation in MODES 1 and 2 may continue for up to 24 hours provided all of the reed switch position indicator channels are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.1.3.3 Each position indicator channel shall be determined to be OPERABLE by verifying the pulse counting position indicator channels and the reed switch position indicator channels agree within 6 steps at least once per 12 hours ~~except during time intervals when the Deviation circuit is inoperable, then compare the pulse counting position indicator and reed switch position indicator channels at least once per 4 hours~~.

REACTIVITY CONTROL SYSTEMS

CEA DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.4 The individual ~~full length (shutdown and control)~~ CEA drop time, from a fully withdrawn position, shall be $\leq$ 2.75 seconds from when electrical power is interrupted to the CEA drive mechanism until the CEA reaches its 90 percent insertion position with:

a. $T_{avg} \geq 515°F$, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With the drop time of any ~~full length~~ CEA determined to exceed the above limit, restore the CEA drop time to within the above limit prior to proceeding to MODE 1 or 2.

b. ~~With the CEA drop times within limits but determined at less than full reactor coolant flow, operation may proceed provided THERMAL POWER is restricted to less than or equal to the maximum THERMAL POWER level allowable for the reactor coolant pump combination operation at the time of CEA drop time determination.~~

SURVEILLANCE REQUIREMENTS

4.1.3.4 The CEA drop time ~~of full length~~ shall be demonstrated through measurement prior to reactor criticality:

a. For all CEAs following each removal of the reactor vessel head,

b. For specifically affected individual CEAs following any maintenance on or modification to the CEA drive system which could affect the drop time of those specific CEAs, and

c. At least once per 18 months.

replace with Insert TS3135

~~September 19, 1975~~

REACTIVITY CONTROL SYSTEMS

SHUTDOWN CEA INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown CEAs shall be withdrawn to at least 176 steps.

APPLICABILITY: MODES 1 and 2*.

ACTION:

With a maximum of one shutdown CEA withdrawn, except for surveillance testing pursuant to Specification 4.1.3.1.2, to less than 176 steps, either:

a. Withdraw the CEA to at least 176 steps within one hour, or

b. Declare the CEA inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown CEA shall be determined to be withdrawn to at least 176 steps:

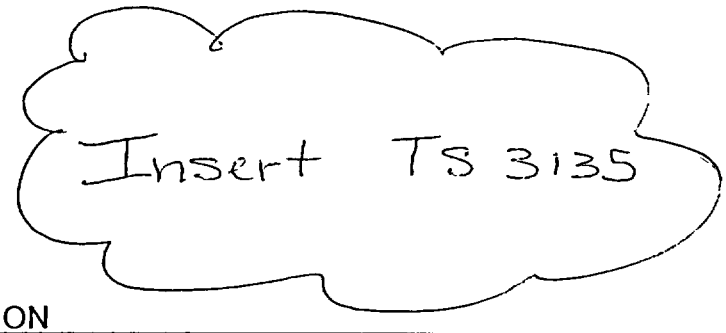
a. Prior to withdrawal of any CEAs in regulating groups during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

*See Special Test Exception 3.10.2.

add

Amendment No.



REACTIVITY CONTROL SYSTEMS

SHUTDOWN CEA INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown CEAs shall be withdrawn to ≥ 176 steps.

APPLICABILITY: MODE 1[(1)],
MODE 2[(1),(2)] with any regulating CEA not fully inserted.

ACTION:

INOPERABLE EQUIPMENT	REQUIRED ACTION
A. One or more shutdown CEAs not within limit.	A.1 Restore shutdown CEA(s) to within limit within 2 hours or otherwise be in MODE 3 within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Verify each shutdown CEA is withdrawn ≥ 176 steps at least once per 12 hours.

(1) This LCO is not applicable while performing Specification 4.1.3.1.2.
(2) See Special Test Exceptions 3.10.1 and 3.10.2.

replace with Insert TS 3136-1

~~February 14, 1992~~

REACTIVITY CONTROL SYSTEMS

REGULATING CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The regulating CEA groups shall be limited to the withdrawal sequence and to the insertion limits provided in the CORE OPERATING LIMITS REPORT. Regulating CEAs are considered to be fully withdrawn when withdrawn to at least 176 steps. CEA insertion between the Long Term Steady State Insertion Limits and the Transient Insertion Limits restricted to the limits provided in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

a. With the regulating CEA groups inserted beyomd the Transient Insertion Limits provided in the CORE OPERATING LIMITS REPORT, except for surveillance testing pursuant to Specification 4.1.3.1.2, within two hours either:

1. Restore the regulating CEA groups to within the limits, or

2. Reduce THERMAL POWER to that fraction of RATED THERMAL POWER which is allowed by the CEA group position using the above figures.

b. With the regulating CEA groups inserted between the Long Term Steady State Insertion Limits and the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT for intervals > 4 hours per 24 hour interval, except during operation pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1, operation may proceed provided either:

1. The Short Term Steady State Insertion Limits specified in the CORE OPERATING LIMITS REPORT are not exceeded, or

2. Any subsequent increase in THERMAL POWER is restricted to ≤ 5% of RATED THERMAL POWER per hour.

*See Special Test Exception 3.10.2 and 3.10.5.
#With $K_{eff} \geq 1.0$.

replace with Inserts TS3136 2 #3

~~June 16, 1998~~

REACTIVITY CONTROL SYSTEMS

REGULATING CEA INSERTION LIMITS (Continued)

SURVEILLANCE REQUIREMENTS

c. With the regulating CEA groups inserted between the Long Term Steady State Insertion Limits and the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT for intervals > 5 EFPD per 30 EFPD interval or > 14 EFPD per calendar year, except during operations pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1, either:

1. Restore the regulating groups to within the Long Term Steady State Insertion Limits provided in the CORE OPERATING LIMITS REPORT within two hours, or

2. Be in HOT STANDBY within 4 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each regulating CEA group shall be determined to be within the Transient Insertion Limits provided in the CORE OPERATING LIMITS REPORT at least once per 12 hours except during time intervals when the PDIL alarm is inoperable, then verify the individual CEA positions at least once per 4 hours. The accumulated times during which the regulatory CEA groups are inserted between the Long Term Steady State Insertion Limits and the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT shall be determined at least once per 24 hours specified.

(1)

Insert TS 3136-1

REACTIVITY CONTROL SYSTEMS

REGULATING CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The power dependent insertion limit (PDIL) alarm circuit shall be OPERABLE, and the regulating CEA groups shall be limited to the withdrawal sequence and to the insertion limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY[1]: MODES 1[2] and 2[2],[3]

ACTION:

INOPERABLE EQUIPMENT	REQUIRED ACTION
A. Regulating CEA groups inserted beyond the Transient Insertion Limits provided in the CORE OPERATING LIMITS REPORT.	A.1 Restore regulating CEA groups to within limits specified in the CORE OPERATING LIMITS REPORT within 2 hours or otherwise be in MODE 3 within the next 6 hours. OR A.2 Reduce THERMAL POWER to less than or equal to the fraction of RATED THERMAL POWER allowed by the CEA group position and insertion limits specified in the CORE OPERATING LIMITS REPORT within 2 hours or otherwise be in MODE 3 within the next 6 hours.

1 This LCO is not applicable while performing Specification 4.1.3.1.2.

2 See Special Test Exceptions 3.10.1 and 3.10.2

3 With $K_{eff} \geq 1.0$

Insert TS 3136-2

B. Regulating CEA groups inserted between the Long Term Steady State Insertion limit and the Transient Insertion Limit specified in the CORE OPERATING LIMITS REPORT for intervals > 4 hours per 24 hour interval.	B.1 Verify Short Term Steady State Insertion Limits as specified in the CORE OPERATING LIMITS REPORT are not exceeded within 15 minutes or otherwise be in MODE 3 within the next 6 hours. OR B.2 Restrict increases in THERMAL POWER to < 5% RATED THERMAL POWER per hour within 15 minutes or otherwise be in MODE 3 within the next 6 hours.
C. Regulating CEA groups inserted between the Long Term Steady State Insertion Limit and the Transient Insertion Limit specified in the CORE OPERATING LIMITS REPORT for intervals > 5 effective full power days (EFPD) per 30 EFPD or interval > 14 EFPD per 365 EFPD.	C.1 Restore regulating CEA groups to within the Long Term Steady State Insertion Limit specified in the CORE OPERATING LIMITS REPORT within 2 hours or otherwise be in MODE 3 within the next 6 hours.
D. PDIL alarm circuit inoperable.	D.1 Perform Specification 4.1.3.6.1 within 1 hour and once per 4 hours thereafter or otherwise be in MODE 3 within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6.1 Verify each regulating CEA group position is within the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT at least once per 12 hours. The provisions of Specification 4.0.4 are not applicable for entering into MODE 2 from MODE 3.

4.1.3.6.2 Verify the accumulated times during which the regulating CEA groups are inserted beyond the Steady State Insertion Limits but within the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT at least once per 24 hours.

4.1.3.6.3 Verify PDIL alarm circuit is OPERABLE at least once per 31 days.

No change

October 12, 1990

3/4.2 POWER DISTRIBUTION LIMITS

For Information Only

LINEAR HEAT RATE

LIMITING CONDITION FOR OPERATION (Continued)

3.2.1 The linear heat rate, including heat generated in the fuel, clad and moderator, shall not exceed the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1.

ACTION:

During operation with the linear heat rate being monitored by the Incore Detector Monitoring System, comply with the following ACTION:

With the linear heat rate exceeding the limit as indicated by four or more coincident incore channels, within 15 minutes initiate corrective action to reduce the linear heat rate to less than or equal to the limit and either:

a. Restore the linear heat rate to less than or equal to the limit within one hour, or

b. Be in at least HOT STANDBY within the next 6 hours.

During operation with the linear heat rate being monitored by the Excore Detector Monitoring System, comply with the following ACTIONS:

With the linear heat rate exceeding its limit, as indicated by the AXIAL SHAPE INDEX being outside of the power dependent limits on the Power Ratio Recorder, either:

a. Restore the AXIAL SHAPE INDEX to within the limits specified in the CORE OPERATING LIMITS REPORT within 1 hour from initially exceeding the linear heat rate limit, or

b. Be in at least HOT STANDBY within the next 4 hours.

SURVEILLANCE REQUIREMENT

4.2.1.1 The linear heat rate shall be determined to be within its limits by continuously monitoring the core power distribution with either the excore detector monitoring system or with the incore detector monitoring system.

Insert TS 324-1

POWER DISTRIBUTION LIMITS

AZIMUTHAL POWER TILT - T_q

LIMITING CONDITION FOR OPERATION

3.2.4 The AZIMUTHAL POWER TILT (T_q) shall be ≤ 0.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% of RATED THERMAL POWER[1].

ACTION:

a. With the indicated T_q > 0.02 but ≤ 0.10, either restore T_q to ≤ 0.02 within 2 hours or verify the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F^T_r) is within the limit of Specification 3.2.3 within 2 hours and once per 8 hours thereafter. Or otherwise, reduce THERMAL POWER to ≤ 50% of RATED THERMAL POWER within the next 4 hours.

b. With the indicated T_q > 0.10, perform the following actions:[2]
   1. Verify the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F^T_r) is within the limit of Specification 3.2.3 within 2 hours; and
   2. Reduce THERMAL POWER to ≤ 50% of RATED THERMAL POWER within 2 hours; and
   3. Restore T_q ≤ 0.02 prior to increasing THERMAL POWER. Correct the cause of the out of limit condition prior to increasing THERMAL POWER. Subsequent power operation above 50% of RATED THERMAL POWER may proceed provided that the measured T_q is verified ≤ 0.02 at least once per hour for 12 hours, or until verified at 95% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.2.4.1 Verify T_q is within limit at least once every 12 hours. The provisions of Specification 4.0.4 are not applicable for entering into MODE 1 with THERMAL POWER > 50% of RATED THERMAL POWER from MODE 1.

---

1 See Special Test Exception 3.10.2.

2 All subsequent Required Actions must be completed if power reduction commences prior to restoring T_q ≤ 0.10.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENT (Continued)

4.2.1.2 Excore Detector Monitoring System(1) - The excore detector monitoring system may be used for monitoring the core power distribution by:

a. Verifying at least once per 12 hours that the ~~full length~~ CEAs are withdrawn to and maintained at or beyond the Long Term Steady State Insertion Limits of Specification 3.1.3.6.

b. Verifying at least once per 31 days that the AXIAL SHAPE INDEX alarm setpoints are adjusted to within the allowable limits specified in the CORE OPERATING LIMITS REPORT.

4.2.1.3 Incore Detector Monitoring System(2),(3) - The incore detector monitoring system may be used for monitoring the core power distribution by verifying that the incore detector Local Power Density alarms:

a. Are adjusted to satisfy the requirements of the core power distribution map which shall be updated at least once per 31 days.

b. Have their alarm setpoint adjusted to less than or equal to the limits ~~when the factors~~ specified in the CORE OPERATING LIMITS REPORT ~~are appropriately included in the setting of these alarms~~.

Insert TS 321

Insert TS321

Only

(1) Required to be met when the Excore Detector Monitoring System is being used to determine Linear Heat Rate.
(2) Only required to be met when the Incore Detector Monitoring System is being used to determine Linear Heat Rate.
(3) Not required to be performed below 20% RATED THERMAL POWER.

TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR - F^T_r

LIMITING CONDITION FOR OPERATION

3.2.3 The calculated value of F^T_r shall be within the 100% power limit specified in the CORE OPERATING LIMITS REPORT. The F^T_r value shall include the effect of AZIMUTHAL POWER TILT.

APPLICABILITY: MODE 1 with THERMAL POWER >20% RTP*.

ACTION:

With F^T_r exceeding the 100% power limit within 6 hours either:

a. Reduce THERMAL POWER to bring the combination of THERMAL POWER and F^T_r to within the power dependent limit specified in the CORE OPERATING LIMITS REPORT and withdraw the ~~full-length~~ CEAs to or beyond the Long Term Steady State Insertion Limits of Specification 3.1.3.6; or
b. Be in at least HOT STANDBY.

SURVEILLANCE REQUIREMENTS

4.2.3.1 The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 F^T_r shall be determined to be within the 100% power limit at the following intervals:

a. Prior to operation above 70 percent of RATED THERMAL POWER after each fuel loading,
b. At least once per 31 days of accumulated operation in Mode 1, and
c. Within four hours if the AZIMUTHAL POWER TILT (T_q) is > 0.020.

4.2.3.3 F^T_r shall be determined by using the incore detectors to obtain a power distribution map with all ~~full-length~~ CEAs at or above the Long Term Steady State Insertion Limit for the existing Reactor Coolant Pump Combination.

*See Special Test Exception 3.10.2

replace with Insert TS 3/4-1

POWER DISTRIBUTION LIMITS

AZIMUTHAL POWER TILT - T_q

LIMITING CONDITION FOR OPERATION

3.2.4 The AZIMUTHAL POWER TILT (T_q) shall not exceed 0.02.

APPLICABILITY: MODE 1 above 50% of RATED THERMAL POWER*.

ACTION:

a. With the indicated AZIMUTHAL POWER TILT determined to be $\geq$ 0.02 but $\leq$ 0.10, either correct the power tilt within two hours or determine within the next 2 hours and at least once per subsequent 8 hours, that the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F_r^I) is within the limit of Specification 3.2.3.

b. With the indicated AZIMUTHAL POWER TILT determined to be > 0.10, operation may proceed for up to 2 hours provided that the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F_r^I) is within the limits of Specification 3.2.3. Subsequent operation for the purpose of measurement and to identify the cause of the tilt is allowable provided the THERMAL POWER level is restricted to $\leq$ 20% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination.

SURVEILLANCE REQUIREMENT

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The AZIMUTHAL POWER TILT shall be determined to be within the limit by:

a. Calculating the tilt at least once per 7 days when the Channel High Deviation Alarm is OPERABLE,

*See Special Test Exception 3.10.2.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

b. Calculating the tilt at least once per 12 hours when the Channel High Deviation Alarm is inoperable, and

c. Using the incore detectors to determine the AZIMUTHAL POWER TILT at least once per 12 hours when one excore channel is inoperable and THERMAL POWER is > 75% of RATED THERMAL POWER.

Replace with

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TABLE 3.3-1

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2 and *	1
2. Power Level - High	4	2(f)	3	1, 2, 3(d)	2
3. Reactor Coolant Flow - Low	4	2(a)	3	1, 2 (e)	2
4. Pressurizer Pressure - High	4	2	3	1, 2	2
5. Containment Pressure - High	4	2	3	1, 2	2
6. Steam Generator Pressure - Low	4	2(b)	3	1, 2	2
7. Steam Generator Water Level - Low	4	2	3	1, 2	2
8. Local Power Density - High	4	2(c)	3	1	2
9. Thermal Margin/Low Pressure	4	2(a)	3	1,2 (e)	2
10. Loss of Turbine - Hyraulic Fluid Pressure - Low	4	2(c)	3	1	2

Amendment No. 75, 118, 122

(1) January ~~27~~, 1999

TABLE 3.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Wide Range Logarithmic Neutron Flux Monitor - Shutdown	4	0	2	3, 4, 5	4
12. Underspeed - Reactor Coolant Pumps	4	2(a)	3	1, 2(e)	2

~~May 12, 1979~~

TABLE 3.3-1 (Continued)

TABLE NOTATION

*With the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal.

(a) Trip may be bypassed below 5% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is ≥ 5% of RATED THERMAL POWER.

(b) Trip may be manually bypassed when steam generator pressure is < 800 psia and all CEAs are fully inserted; bypass shall be automatically removed when steam generator pressure is ≥ 800 psia.

(c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is ≥ 15% of RATED THERMAL POWER.

(d) Trip does not need to be operable if all the control rod drive mechanisms are de-energized or if the RCS boron concentration is greater than or equal to the refueling concentration of Specification 3.9.1.

(e) ~~Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.~~ Deleted

(f) ΔT Power input to trip may be bypassed below 5% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is ≥ 5% of RATED THERMAL POWER.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 4 hours and/or open the protective system trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel shall either be restored to OPERABLE status, or placed in the tripped condition, within 48 hours.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also declared inoperable, and the appropriate actions are taken for the affected functional units.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 48 hours, provided one of the inoperable channels is placed in the tripped condition.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION (SIAS)(d)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	1
b. Containment Pressure - High	4	2	3	1, 2, 3	2
c. Pressurizer Pressure - Low	4	2	3	1, 2(e), 3(a)	2
2. CONTAINMENT SPRAY (CSAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	1
b. Containment Pressure-- High - High	4	2(b)	3	1, 2, 3	2
3. CONTAINMENT ISOLATION (CIAS)					
a. Manual CIAS (Trip Buttons)	2	1	2	1, 2, 3, 4	1
b. Manual SIAS (Trip Buttons)	2	1	2	1, 2, 3, 4	1
c. Containment Pressure - High	4	2	3	1, 2, 3	2
d. Pressurizer Pressure - Low	4	2	3	1, 2(e), 3(a)	2

~~February 10, 1999~~

TABLE 3.3-3 (Continued)

TABLE NOTATION

(a) Trip function may be bypassed when pressurizer pressure is < 1850 psia; bypass shall be automatically removed when pressurizer pressure is ≥ 1850 psia.

(b) An SIAS signal is first necessary to enable CSAS logic.

(c) Trip function may be bypassed when steam generator pressure is < 700 psia; bypass shall be automatically removed when steam generator pressure is ≥ 700 psia.

(d) In MODE 4 the HPSI pumps are not required to start automatically on a SIAS.

(e) ~~Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.~~ Deleted

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in COLD SHUTDOWN within the next 36 hours.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel shall either be restored to OPERABLE status, or placed in the tripped condition, ~~with~~ within 48 hours.

b. Within 1 hour, all functional ~~units~~ receiving an input from the inoperable channel are also declared inoperable, and the appropriate actions are taken for the affected functional units.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 48 hours, provided one of the inoperable channels is placed in the tripped condition.

~~July 1, 1998~~

REACTOR COOLANT SYSTEM

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION

3.4.9.1 Reactor Coolant System (except the pressurizer) temperature, pressure, and heatup and cooldown rates shall be limited in accordance with the limits specified in Table 3.4-2 and shown on Figures 3.4-2a and 3.4-2b.

APPLICABILITY: At all times.*

ACTION:

a. With any of the above limits exceeded in MODES 1, 2, 3, or 4, perform the following:

   1. Restore the temperature and/or pressure to within limit within 30 minutes.

      AND

   2. Perform an engineering evaluation to determine the effects of the out of limit condition on the structural integrity of the Reactor Coolant System and determine that the Reactor Coolant System remains acceptable for continued operation within 72 hours. Otherwise, be in at least MODE 3 within the next 6 hours and in MODE 5 with RCS pressure less than 300 psia within the following 30 hours.

b. With any of the above limits exceeded in other than MODES 1, 2, 3, or 4, perform the following:

   1. Immediately initiate action to restore the temperature and/or pressure to within limit.

      AND

   2. Perform an engineering evaluation to determine the effects of the out of limit condition on the structural integrity of the Reactor Coolant System and determine that the Reactor Coolant System is acceptable for continued operation prior to entering MODE 4.

~~*See Special Test Exception 3.10.3.~~

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATIONS

~~January 11, 2002~~

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 sufficient to ensure that the more restrictive of following reactivity conditions is met:

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

b. A boron concentration of greater than or equal to 1720 ppm.

APPLICABILITY: MODE 6.

NOTE
Only applicable to the refueling canal when connected to the Reactor Coolant System

ACTION:

With the requirements of the above specification not satisfied, within 15 minutes suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 40 gpm of boric acid solution at or greater than the required refueling water storage tank concentration (ppm) 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 1720 ppm, whichever is the more restrictive.

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

4.9.1.2 The boron concentration of all filled portions 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 Deleted

3.4.10 SPECIAL TEST EXCEPTIONS

SHUTDOWN MARGIN

(3.1.3.5 and 3.1.3.6)

LIMITING CONDITION FOR OPERATION

3.10.1 The ~~SHUTDOWN MARGIN~~ requirement of Specification (5) 3.1.1.1 may be suspended for measurement of CEA worth and shutdown margin provided reactivity equivalent to at least the highest estimated CEA worth (of those CEAs actually withdrawn) is available for trip insertion from OPERABLE CEA(s).

APPLICABILITY: MODES 2 and ~~3~~ (1) during PHYSICS TESTS.

ACTION:

a. With any ~~full length~~ CEA not fully inserted and with less than the above reactivity equivalent available for trip insertion, within 15 minutes initiate and continue boration at > 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all ~~full length~~ CEAs inserted and the reactor subcritical by less than the above reactivity equivalent, immediately initiate and continue boration at > 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

SURVEILLANCE REQUIREMENTS

4.10.1.1 The position of each ~~full length~~ CEA required either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each CEA not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position ~~within 7 days~~ Once prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1 ~~(1)~~ (2)

(1)(2) Not required to be performed during initial power escalation following a refuelling outage if SR 4.1.3.4 has been met.

(2)(1) Operation in MODE 3 shall be limited to 6 consecutive hours.

SPECIAL TEST EXCEPTIONS

PRESSURE/TEMPERATURE LIMITATION - REACTOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.10.3 The minimum temperature and pressure conditions for reactor criticality of Specifications 3.1.1.5 and 3.4.9.1 may be suspended during low temperature PHYSICS TESTS provided:

a. The THERMAL POWER does not exceed 5 percent of RATED THERMAL POWER,

b. The reactor trip setpoints on the OPERABLE power range neutron flux monitoring channels are set at ≤ 20% of RATED THERMAL POWER, and

c. The Reactor Coolant System temperature and pressure relationship is maintained within the acceptable region of operation shown on Figures 3.4-2a and 3.4-2b.

APPLICABILITY: MODE 2.

ACTION:

a. With the THERMAL POWER >5 percent of RATED THERMAL POWER, immediately open the reactor trip breakers.

b. With the Reactor Coolant System temperature and pressure relationship within the unacceptable region of operation on Figures 3.4-2a and 3.4-2b, immediately open the reactor trip breakers and restore the temperature-pressure relationship to within its limit; perform the analysis required by Specification 3.4.9.1 prior to the next reactor criticality.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The Reactor Coolant System shall be verified to be within the acceptable region for operation of Figures 3.4-2a and 3.4-2b at least once per 30 minutes.

4.10.3.2 The THERMAL POWER shall be determined to be ≤ 5% of RATED THERMAL POWER at least once per hour.

4.10.3.3 Each wide range logarithmic and power level channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating low temperature PHYSICS TESTS.

Replace with

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SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

3.10.4 The limitations of Specification 3.4.1 may be suspended during the performance of PHYSICS TESTS provided:

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER, and

b. The reactor trip setpoints of the OPERABLE power level channels are set at $\leq$ 20% of RATED THERMAL POWER.

APPLICABILITY: MODE 2.

ACTION:

With the THERMAL POWER > 5% of RATED THERMAL POWER, immediately trip the reactor.

SURVEILLANCE REQUIREMENTS

4.10.4.1 The THERMAL POWER shall be determined to be $\leq$ 5% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.4.2 Each wide range logarithmic and power level neutron flux monitoring channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.

Replace with

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SPECIAL TEST EXCEPTIONS

~~November 28, 2000~~

CENTER CEA MISALIGNMENT

LIMITING CONDITION FOR OPERATION

3.10.5 The requirements of Specifications 3.1.3.1 and 3.1.3.6 may be suspended during the performance of PHYSICS TESTS to determine the isothermal temperature coefficient and power coefficient provided:

a. Only the center CEA (CEA #1) is misaligned, and

b. The limits of Specification 3.2.1 are maintained and determined as specified in Specification 4.10.5 below.

APPLICABILITY: MODES 1 and 2.

ACTION:

With any of the limits of Specification 3.2.1 being exceeded while the requirements of Specification 3.1.3.1 and 3.1.3.6 are suspended, immediately:

a. Reduce THERMAL POWER sufficiently to satisfy the requirements of Specification 3.2.1, or

b. Be in HOT STANDBY within 2 hours.

SURVEILLANCE REQUIREMENTS

4.10.5.1 The THERMAL POWER shall be determined at least once per hour during PHYSICS TESTS in which the requirements of Specifications 3.1.3.1 and/or 3.1.3.6 are suspended and shall be verified to be within the test power plateau.

4.10.5.2 The linear heat rate shall be determined to be within the limits of Specification 3.2.1 by monitoring it continuously with the Incore Detector Monitoring System pursuant to the requirements of Specification 4.2.1.3 during PHYSICS TESTS above 5% of RATED THERMAL POWER in which the requirements of Specifications 3.1.3.1 and/or 3.1.3.6 are suspended. (1)

Replace with

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DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment building is designed and shall be maintained for a maximum internal pressure of 54 psig and an equilibrium liner temperature of 289°F.

PENETRATIONS

5.2.3 Penetrations through the reactor containment building are designed and shall be maintained in accordance with the design provisions contained in Section 5.2.8 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements. (1)

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 217 fuel assemblies with each fuel assembly containing 176 rods. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.5 weight percent of U-235.

CONTROL ELEMENT ASSEMBLIES

5.3.2 The reactor core shall contain 73 ~~full-length and no part-length~~ control element assemblies. The control element assemblies shall be designed and maintained in accordance with the design provisions contained in Section 3.0 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements. (1)

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

a. In accordance with the code requirements specified in Section 4.2.2 of the FSAR with allowance for normal degradation pursuant of the applicable Surveillance Requirements,

b. For a pressure of 2500 psia, and

c. For a temperature of 650°F except for the pressurizer which is 700°F.

3/4.1.1 ~~BORATION CONTROL~~ REACTIVITY CONTROL SYSTEMS

3/4.1.1.1 ~~and 3/4.1.1.2~~ SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS T_{avg}. The most restrictive condition occurs at EOL, with T_{avg} at no load operating temperature, and is associated with a postulated steam line break accident and resulting uncontrolled RCS cooldown. In the analysis of this accident, the minimum SHUTDOWN MARGIN specified in the CORE OPERATING LIMITS REPORT is initially required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN required by Specification 3.1.1.1 is based upon this limiting condition and is consistent with FSAR accident analysis assumptions. ~~For earlier periods~~ Insert L during the fuel cycle, this value is conservative. ~~With $T_{avg} \leq 200°F$, the reactivity transients resulting from any postulated accident are minimal and the reduced SHUTDOWN MARGIN specified in the CORE OPERATING LIMITS REPORT provides adequate protection.~~

3/4.1.1.3 BORON DILUTION Insert K

A minimum flow rate of at least 1000 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual during reductions in Reactor Coolant System boron concentration. The 1000 GPM limit is the minimum required shutdown cooling flow to satisfy the boron dilution accident analysis. This 1000 GPM flow is an analytical limit. Plant operating procedures maintain the minimum shutdown cooling flow at a higher value to accommodate flow measurement uncertainties. While the plant is operating in reduced inventory operations, plant operating procedures also specify an upper flow limit to prevent vortexing in the shutdown cooling system. A flow rate of at least 1000 GPM will circulate the full Reactor Coolant System volume in approximately 90 minutes. With the RCS in mid-loop operation, the Reactor Coolant System volume will circulate in approximately 25 minutes. The reactivity change rate associated with reductions in Reactor Coolant System boron concentration will be within the capability for operator recognition and control.

3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC)

The limitations on MTC are provided to ensure that the assumptions used in the accident and transient analyses remain valid through each fuel cycle. The surveillance requirements for measurement of the MTC during each fuel cycle are adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured MTC value is within its limit provides assurance that the coefficient will be maintained within acceptable values throughout each fuel cycle.

Insert L, Page B 3/4 1-1

The SHUTDOWN MARGIN is verified by performing a reactivity balance calculation, considering the listed reactivity effects:

a. RCS boron concentration;
b. CEA positions;
c. RCS average temperature;
d. Fuel burnup based on gross thermal energy generation;
e. Xenon concentration; and
f. Samarium concentration.

3/4.1.1.2 REACTIVITY BALANCE

Reactivity balance is used as a measure of the predicted versus measured core reactivity during power operation. The periodic confirmation of core reactivity is necessary to ensure that Design Basis Accident (DBA) and transient safety analyses remain valid. A large reactivity difference could be the result of unanticipated changes in fuel, control element assembly (CEA) worth, or operation at conditions not consistent with those assumed in the predictions of core reactivity, and could potentially result in a loss of SHUTDOWN MARGIN (SDM) or violation of acceptable fuel design limits. Comparing predicted versus measured core reactivity validates the nuclear methods used in the safety analysis and supports the SDM demonstrations (LCO 3.1.1.1, "SHUTDOWN MARGIN (SDM)") in ensuring the reactor can be brought safely to cold, subcritical conditions.

The normalization of predicted RCS boron concentration to the measured value is typically performed after reaching RATED THERMAL POWER following startup from a refueling outage, with the CEAs in their normal positions for power operation. The normalization is performed at BOC conditions, so that core reactivity relative to predicted values can be continually monitored and evaluated as core conditions change during the cycle.

When measured core reactivity is within $\pm 1\%$ $\Delta k/k$ of the predicted value at steady state thermal conditions, the core is considered to be operating within acceptable design limits.

The limits on core reactivity must be maintained during MODES 1 and 2 because a reactivity balance must exist when the reactor is critical or producing THERMAL POWER. This Specification does not apply in MODES 3, 4, and 5 because the reactor is shut down and the reactivity balance is not changing.

In MODE 6, fuel loading results in a continually changing core reactivity. Boron concentration requirements (LCO 3.9.1, "Boron Concentration") ensure that fuel movements are performed within the bounds of the safety analysis.

3/4.1.2 BORATION SYSTEMS ~~(Continued)~~ stet

The provision in Specification 3.1.2.4 that Specifications 3.0.4 and 4.0.4 are not applicable for entry into MODE 4 is provided to allow for closing the motor circuit breaker and subsequent testing of the inoperable charging pump. Specification 3.4.9.3, which is applicable to MODES 5 and 6, requires that one charging pump be capable of injecting into the RCS at or below 190°F. Specification 3.1.2.4 requires that at least two charging pumps be OPERABLE in MODES 1, 2, 3, and 4. The exception from Specification 3.0.4 and 4.0.4 will allow Millstone Unit No. 2 to enter into MODE 4 and test the inoperable charging pump and declare it OPERABLE.

Surveillance Requirement (SR) 4.1.2.2.a requires all testable power operated valves in each required flow path to be exercised through one complete cycle at least once per 7 days. This surveillance requirement does not apply to 2-CS-13.1B. This motor operated valve is in the RWST supply to the charging pumps and the RWST supply to the Facility 2 emergency core cooling pumps (HPSI, LPSI, and CS). It is key-locked in the open position during normal plant operation. This valve is not in the boration flow path when it is in the normal locked open position, and it is a non-testable valve in Modes 1 through 4 for boration flow path verification due to the increase in plant risk with no offsetting improvement in plant safety. Therefore, it is not necessary to stroke this valve at least once per 7 days for the boration flow path verification required by SR 4.1.2.2.a. However, for additional assurance, 2-CS-13.1B should be verified locked open when performing SR 4.1.2.2.a.

3/4.1.3 MOVEABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met.

The ACTION statements applicable to an immovable or untrippable CEA and to a large misalignment (≥ 20 steps) of two or more CEAs, require a prompt shutdown of the reactor since either

Replace with Insert F

3/4.1.3 MOVEABLE CONTROL ASSEMBLIES (Continued)

of these conditions may be indicative of a possible loss of mechanical functional capability of the CEAs and in the event of a immovable or untrippable CEA, the loss of SHUTDOWN MARGIN.

For small misalignments (< 20 steps) of the CEAs, there is 1) a small degradation in the peaking factors relative to those assumed in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 2) a small effect on the time dependent long term power distributions relative to those used in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 3) a small effect on the available SHUTDOWN MARGIN, and 4) a small effect on the ejected CEA worth used in the safety analysis. Therefore, the ACTION statement associated with the small misalignment of a CEA permits a one hour time interval during which attempts may be made to restore the CEA to within its alignment requirements prior to initiating a reduction in THERMAL POWER. The one hour time limit is sufficient to (1) identify causes of a misaligned CEA, (2) take appropriate corrective action to realign the CEAs and (3) minimize the effects of xenon redistribution.

Overpower margin is provided to protect the core in the event of a large misalignment (≥ 20 steps) of a CEA. However, this misalignment would cause distortion of the core power distribution. The reactor protective system would not detect the degradation in the radial peaking factor and since variations in other system parameters (e.g., pressure and coolant temperature) may not be sufficient to cause trips, it is possible that the reactor could be operating with process variables less conservative than those assumed in generating LCO and LSSS setpoints. Therefore, the ACTION statement associated with the large misalignment of a CEA requires a prompt and significant reduction in THERMAL POWER prior to attempting realignment of the misaligned CEA.

The ACTION statements applicable to misaligned or inoperable CEAs include requirements to align the OPERABLE CEAs in a given group with the inoperable CEA. Conformance with these alignment requirements bring the core, within a short period of time, to a configuration consistent with that assumed in generating LCO and LSSS setpoints. However, extended operation with CEAs significantly inserted in the core may lead to perturbations in 1) local burnup, 2) peaking factors and 3) available shutdown margin which are more adverse than the conditions assumed to exist in the

Insert F, Page B 3/4 1-3a

A CEA may become misaligned, yet remain trippable. In this condition, the CEA can still perform its required function of adding negative reactivity should a reactor trip be necessary. If one or more CEAs (regulating or shutdown) are misaligned by > 10 steps and $\leq$ 20 steps but trippable, or one CEA is misaligned by > 20 steps but trippable, continued operation in MODES 1 and 2 may continue, provided, within 1 hour, the power is reduced to < 70% RATED THERMAL POWER, and within 2 hours CEA alignment is restored. If negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Regulating CEA alignment can be restored by either aligning the misaligned CEA(s) to within 10 steps of its group or aligning the misaligned CEA's group to within 10 steps of the misaligned CEA. A Regulating CEA is considered fully inserted when either the Dropped Rod indication or lower Electrical Limit indication lights on the core mimic display are illuminated. A Regulating CEA is considered to be fully withdrawn when withdrawn $\geq$ 176 steps. Shutdown CEA alignment can only be restored by aligning the misaligned CEA(s) to within 10 steps of its group.

Xenon redistribution in the core starts to occur as soon as a CEA becomes misaligned. Reducing THERMAL POWER ensures acceptable power distributions are maintained. For small misalignments (< 20 steps) of the CEAs, there is:

a. A small effect on the time dependent long term power distributions relative to those used in generating LCOs and limiting safety system settings (LSSS) setpoints;

b. A negligible effect on the available SHUTDOWN MARGIN; and

c. A small effect on the ejected CEA worth used in the accident analysis.

With a large CEA misalignment (> 20 steps), however, this misalignment would cause distortion of the core power distribution. This distortion may, in turn, have a significant effect on the time dependent, long term power distributions relative to those used in generating LCOs and LSSS setpoints. The effect on the available SHUTDOWN MARGIN and the ejected CEA worth used in the accident analysis remain small. Therefore, this condition is limited to a single CEA misalignment, while still allowing 2 hours for recovery.

In both cases, a 2 hour time period is sufficient to:

a. Identify cause of a misaligned CEA;

b. Take appropriate corrective action to realign the CEAs; and

c. Minimize the effects of xenon redistribution.

If a CEA is untrippable, it is not available for reactivity insertion during a reactor trip. With an untrippable CEA, meeting the insertion limits of LCO 3.1.3.5 and LCO 3.1.3.6 does not ensure that adequate SHUTDOWN MARGIN exists. With one or more CEAs untrippable the plant is transitioned to MODE 3 within 6 hours.

The CEA motion inhibit permits CEA motion within the requirements of LCO 3.1.3.6, "Regulating Control Element Assembly (CEA) Insertion Limits," and the CEA deviation circuit prevents regulating CEAs from being misaligned from other CEAs in the group. With the CEA motion inhibit inoperable, a time of 6 hours is allowed for restoring the CEA motion inhibit to OPERABLE status, or placing and maintaining the CEA drive switch in either the "off" or "manual" position, fully withdrawing all CEAs in group 7 to < 5% insertion. Placing the CEA drive switch in the "off" or "manual" position ensures the CEAs will not move in response to Reactor Regulating System automatic motion commands. Withdrawal of the CEAs to the positions required in the Required Action B.2 ensures that core perturbations in local burnup, perking factors, and SHUTDOWN MARGIN will not be more adverse than the Conditions assumed in the safety analyses and LCO setpoint determination. Required Action B.2 is modified by a Note indicating that performing this Required Action is not required when in conflict with Required Actions A.1 or C.1.

Continued operation is not allowed in the case of more than one CEA misaligned from any other CEA in its group by > 20 steps, or one or more CEAs untrippable. This is because these cases are indicative of a loss of SHUTDOWN MARGIN and power distribution changes, and a loss of safety function, respectively.

3/4.1.3 MOVEABLE CONTROL ASSEMBLIES (Continued)

~~safety analyses and LCO and LSSS setpoints determination. Therefore, time limits have been imposed on operation with inoperable CEAs to preclude such adverse conditions from developing.~~

Operability of the CEA position indicators (Specification 3.1.3.3) is required to determine CEA positions and thereby ensure compliance with the CEA alignment and insertion limits and ensures proper operation of the rod block circuit. The CEA "Full In" and "Full Out" limits provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the ACTION statements applicable to inoperable CEA position indicators permit continued operations when the positions of CEAs with inoperable position indicators can be verified by the "Full In" or "Full Out" limits.

Position Indicator channel

CEA Motion Inhibit and CEA deviation

CEA positions and OPERABILITY of the CEA position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied.

The maximum CEA drop time permitted by Specification 3.1.3.4 is the assumed CEA drop time used in the accident analyses. Measurement with $T_{avg} \geq 515°F$ and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES (Continued)

The LSSS setpoints and the power distribution LCOs were generated based upon a core burnup which would be achieved with the core operating in an essentially unrodded configuration. Therefore, the CEA insertion limit specifications require that during MODES 1 and 2, the ~~full length~~ CEAs be nearly fully withdrawn. The amount of CEA insertion permitted by the Long Term Steady State Insertion Limits of Specification 3.1.3.6 will not have a significant effect upon the unrodded burnup assumption but will still provide sufficient reactivity control. The Transient Insertion Limits of Specification 3.1.3.6 are provided to ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels; however, long term operation at these insertion limits could have adverse effects on core power distribution during subsequent operation in an unrodded configuration. The PDIL alarm ~~is~~ provided by the CEAPDS computer.

The control rod drive mechanism requirement of specification 3.1.3.7 is provided to assure that the consequences of an uncontrolled CEA withdrawal from subcritical transient will stay within acceptable levels. This specification assures that reactor coolant system conditions exist which are consistent with the plant safety analysis prior to energizing the control rod drive mechanisms. The accident is precluded when conditions exist which are inconsistent with the safety analysis since deenergized drive mechanisms cannot withdraw a CEA. The drive mechanisms may be energized with the boron concentration greater than or equal to the refueling concentration since, under these conditions, adequate SHUTDOWN MARGIN is maintained, even if all CEAs are fully withdrawn from the core.

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System and the Incore Detector Monitoring System, provide adequate monitoring of the core power distribution and are capable of verifying that the linear heat rate does not exceed its limits. The Excore Detector Monitoring System performs this function by continuously monitoring the AXIAL SHAPE INDEX with two OPERABLE excore neutron flux detectors and verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits specified in the Core Operating Limits Report using the Power Ratio Recorder. The power dependent limits of the Power Ratio Recorder are less than or equal to the limits specified in the Core Operating Limits Report. In conjunction with the use of the excore monitoring system and in establishing the AXIAL SHAPE INDEX limits, the following assumptions are made: 1) the CEA insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are satisfied, 2) the AZIMUTHAL POWER TILT restrictions of Specification 3.2.4 are satisfied, and 3) the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR does not exceed the limits of Specification 3.2.3.

The Incore Detector Monitoring System continuously provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments ensure that the peak linear heat rates will be maintained within the allowable limits specified in the Core Operating Limits Report. The setpoints for these alarms include allowances, set in the conservative directions, ~~for 1) a flux peaking augmentation factor, 2) a measurement-calculational uncertainty factor, 3) an engineering uncertainty factor, 4) an allowance for axial fuel densification and thermal expansion, and 5) a THERMAL POWER measurement uncertainty factor specified in the Core Operating Limits Report. Note the Items (1) and (4) above are only applicable to fuel batches "A" through "L".~~ The Incore Detector Monitoring System is not used to monitor linear heat rate below 20% of RATED THERMAL POWER. The accuracy of the neutron flux information from the incore detectors is not reliable at THERMAL POWER < 20% RATED THERMAL POWER.

3/4.2.3 and 3/4.2.4 TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTORS F^T, AND AZIMUTHAL POWER TILT - T_q

The limitations on F^T, and T_q are provided to 1) ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local power Density - High LCOs and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits, and, 2) ensure that the assumptions used in the analysis establishing the DNB Margin LCO, and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If F^T, or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed

by the ACTION statements since these additional restrictions provide adequate provisions to assure that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density - High LCOs and LSSS setpoints remain valid. An AZIMUTHAL POWER TILT > 0.10 is not expected and if it should occur, subsequent operation would be restricted to only those operations required to identify the cause of this unexpected tilt. Insert I1

a. Data from the incore detectors are used for determining the measured radial peaking factors. Technical Specification 3.2.3 is not applicable below 20% of RATED THERMAL POWER because the accuracy of the neutron flux information from the incore detectors is not reliable at THERMAL POWER < 20% RATED THERMAL POWER. Insert I2

The surveillance requirements for verifying that F^T_r and T_q are within their limits provide assurance that the actual values of F^T_r and T_q do not exceed the assumed values. Verifying F^T_r after each fuel loading prior to exceeding 70% of RATED THERMAL POWER provides additional assurance that the core was properly loaded.

3/4.2.6 DNB MARGIN

The limitations provided in this specification ensure that the assumed margins to DNB are maintained. The limiting values of the parameters in this specification are those assumed as the initial conditions in the accident and transient analyses; therefore, operation must be maintained within the specified limits for the accident and transient analyses to remain valid.

Insert I1, Page B 3/4 2-2

Core power distribution is a concern any time the reactor is critical. The Total Integrated Radial Peaking Factor - F^T_r LCO, however, is only applicable in MODE 1 above 20% of RATED THERMAL POWER. The reasons that this LCO is not applicable below 20% of RATED THERMAL POWER are:

Insert I2, Page B 3/4 2-2

b. When core power is below 20% of RATED THERMAL POWER, the core is operating well below its thermal limits, and the Local Power Density (fuel pellet melting) and Thermal Margin/Low Pressure (DNB) trips are highly conservative.

3/4.10 SPECIAL TEST EXCEPTIONS

BASES

3/4.10.1 SHUTDOWN MARGIN

This special test exception provides that a minimum amount of CEA worth is immediately available for reactivity control or that the reactor is sufficiently subcritical so as to provide safe operating conditions when tests are performed for CEA worth measurement. This special test exception is required to permit the periodic verification of the actual versus predicted core reactivity condition occuring as a result of fuel burnup or fuel cycling operations.

5

3/4.10.2 GROUP HEIGHT AND INSERTION LIMITS

This special test exception permits individual CEAs to be positioned outside of their normal group heights and insertion limits during the performance of such PHYSICS TESTS as those required to 1) measure CEA worth and 2) determine the reactor stability index and damping factor under xenon oscillation conditions.

3/4.10.3 PRESSURE/TEMPERATURE LIMITATION - REACTOR CRITICALITY

This special test exception permits the reactor to be critical at less than 5% of RATED THERMAL POWER during low temperature PHYSICS TESTING required to measure such parameters as CEA worth and SHUTDOWN MARGIN.

3/4.10.4 PHYSICS TESTS

This special test exception permits PHYSICS TESTS to be performed at $\leq$ 5% of RATED THERMAL POWER and is required to verify the fundamental nuclear characteristics of the reactor core and related instrumentation.

3/4.10.5 CENTER CEA MISALIGNMENT

This special test exception permits the center CEA to be misaligned during PHYSICS TESTS required to determine the isothermal temperature coefficient and power coefficient.

Docket No. 50-336
B18724

Attachment 4

Millstone Nuclear Power Station, Unit No. 2

Technical Specifications Change Request 2-15-02
Changes In Technical Specifications Related To Reactivity Control Systems,
Power Distribution Limits, And Special Test Exceptions
Retyped Pages

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LIMITING CONDITIONS FOR OPERATION AND SURVILLANCE REQUIREMENTS

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LIMITING CONDITION FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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BASES

CORE ALTERATION

1.12 CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

SHUTDOWN MARGIN

1.13 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming all control element assemblies (shutdown and regulating) are fully inserted except for the single assembly of highest reactivity worth which is assumed to be fully withdrawn.

IDENTIFIED LEAKAGE

1.14 IDENTIFIED LEAKAGE shall be:

a. Leakage into closed systems, such as pump seal or valve packing leaks that are captured, and conducted to a sump or collecting tank, or

b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be PRESSURE BOUNDARY LEAKAGE.

UNIDENTIFIED LEAKAGE

1.15 UNIDENTIFIED LEAKAGE shall be all leakage which is not IDENTIFIED LEAKAGE or CONTROLLED LEAKAGE.

PRESSURE BOUNDARY LEAKAGE

1.16 PRESSURE BOUNDARY LEAKAGE shall be leakage (except steam generator tube leakage) through a non-isolable fault in a Reactor Coolant System component body, pipe wall or vessel wall.

CONTROLLED LEAKAGE

1.17 CONTROLLED LEAKAGE shall be the water flow from the reactor coolant pump seals.

3/4.1 REACTVITY CONTROL SYSTEMS

3/4.1.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN - (SDM)

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be within the limit specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 3[1], 4 and 5.

ACTION:

With the SHUTDOWN MARGIN not within the limit specified in the CORE OPERATING LIMITS REPORT, within 15 minutes, initiate and continue boration at $\geq$ 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the SHUTDOWN MARGIN is restored to within limit.

SURVEILLANCE REQUIREMENT

4.1.1.1 Verify SHUTDOWN MARGIN is within the limit specified in the CORE OPERATING LIMITS REPORT at least once every 24 hours.

[1] See Special Test Exception 3.10.1

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3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 REACTIVITY CONTROL SYSTEMS

REACTIVITY BALANCE

LIMITING CONDITION FOR OPERATION

3.1.1.2 The core reactivity balance shall be within ± 1% Δk/k of predicted values.

APPLICABILITY: MODES 1 and 2.

ACTION:

With core reactivity balance not within limit:

Re-evaluate core design and safety analysis and determine that the reactor core is acceptable for continued operation and establish appropriate operating restrictions and Surveillance Requirements within 7 days or otherwise be in MODE 3 within the next 6 hours.

SURVEILLANCE REQUIREMENT

4.1.1.2 Verify[1] overall core reactivity balance is within ± 1% Δk/k of predicted values prior to entering MODE 1 after fuel loading and at least once every 31 Effective Full Power Days[2]. The provisions of Specification 4.0.4 are not applicable.

(1) The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

(2) Only required after 60 Effective Full Power Days.

BORON DILUTION

LIMITING CONDITION FOR OPERATION

3.1.1.3 The flow rate of reactor coolant through the core shall be ≥ 1000 gpm whenever a reduction in Reactor Coolant System boron concentration is being made.

APPLICABILITY: ALL MODES.

ACTION:

With the flow rate of reactor coolant through the core < 1000 gpm, immediately suspend all operations involving a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.1.1.3* The reactor coolant flow rate through the core shall be determined to be ≥ 1000 gpm prior to the start of and at least once per hour during a reduction in the Reactor Coolant System boron concentration by either:

a. Verifying at least one reactor coolant pump is in operation, or

b. Verifying that at least one low pressure safety injection pump is in operation and supplying ≥ 1000 gpm through the core.

*When the plant is in MODE 1 or 2, reactor coolant pumps are required to be in operation. Therefore, Surveillance Requirement 4.1.1.3 does not have to be performed in MODES 1 and 2.

REACTIVITY CONTROL SYSTEMS

MINIMUM TEMPERATURE FOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.1.1.5 The Reactor Coolant System temperature (T_{avg}) shall be $\geq$ 515°F when the reactor is critical.

APPLICABILITY: MODES 1 and 2#.

ACTION:

With the Reactor Coolant System temperature (T_{avg}) < 515°F, restore T_{avg} to within its limit within 15 minutes or be in HOT STANDBY within the next 15 minutes.

SURVEILLANCE REQUIREMENTS

4.1.1.5 The Reactor Coolant System temperature (T_{avg}) shall be determined to be $\geq$ 515°F.

a. Within 15 minutes prior to making the reactor critical, and

b. At least once per hour when the reactor is critical and the Reactor Coolant System temperature (T_{avg}) is < 525°F.

#With $K_{eff} \geq 1.0$.

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 All CEAs shall be OPERABLE and aligned to within 10 steps (indicated position) of their respective group, and the CEA Motion Inhibit and the CEA Deviation Circuit shall be OPERABLE.

APPLICABILITY: MODES 1[1] and 2[1].

ACTION:

INOPERABLE EQUIPMENT	REQUIRED ACTION
A. One or more CEAs trippable and misaligned from its group by > 10 steps and < 20 steps. OR One CEA trippable and misaligned from its group by > 20 steps.	A.1 Reduce THERMAL POWER to < 70% of the maximum allowable THERMAL POWER within 1 hour and restore CEA(s) misalignment within 2 hours or otherwise be in MODE 3 within the next 6 hours.
B. CEA Motion Inhibit inoperable.	B.1 Verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter, and restore CEA Motion Inhibit to OPERABLE status within 6 hours or otherwise be in MODE 3 within the next 6 hours. OR B.2[2] Place and maintain the CEA drive system mode switch in either the "off" or "manual" position, and withdraw all CEAs in group 7 to ≥ 172 steps within 6 hours or otherwise be in MODE 3 within the next 6 hours.

(1) See Special Test Exception 3.10.2

(2) Performance of Action B.2 is allowed only when not in conflict with either Required Action A.1 or C.1.

ACTION (Continued):

C. CEA Deviation Circuit inoperable.	C.1 Verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group within 1 hour and every 4 hours thereafter or otherwise be in MODE 3 within the next 6 hours.
D. One or more CEAs untrippable. OR Two or more CEAs misaligned by > 20 steps.	D.1 Be in MODE 3 within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 Verify the indicated position of each CEA to be within 10 steps of all other CEAs in its group at least once per 12 hours AND within 1 hour following any CEA movement larger than 10 steps.

4.1.3.1.2 Verify CEA freedom of movement (trippability) by moving each individual CEA that is not fully inserted into the reactor core 10 steps in either direction at least once per 92 days.

4.1.3.1.3 Verify the CEA Deviation Circuit is OPERABLE at least once per 92 days by a functional test of the CEA group Deviation Circuit which verifies that the circuit prevents any CEA from being misaligned from all other CEAs in its group by more than 10 steps (indicated position).

4.1.3.1.4 Verify the CEA Motion Inhibit is OPERABLE by a functional test which verifies that the circuit maintains the CEA group overlap and sequencing requirements of Specification 3.1.3.6 and that the circuit prevents regulating CEAs from being inserted beyond the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT:

a. Prior to each entry into MODE 2 from MODE 3, except that such verification need not be performed more often than once per 31 days, and

b. At least once per 6 months.

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POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.3 All shutdown and regulating CEA reed switch position indicator channels and CEA pulse counting position indicator channels shall be OPERABLE and capable of determining the absolute CEA positions within ± 3 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. Deleted.

b. With a maximum of one reed switch position indicator channel per group or one (except as permitted by ACTION item d. below) pulse counting position indicator channel per group inoperable and the CEA(s) with the inoperable position indicator channel partially inserted, within 4 hours either:

1. Restore the inoperable position indicator channel to OPERABLE status, or

2. Be in HOT STANDBY, or

3. Reduce THERMAL POWER to ≤ 70% of the maximum allowable THERMAL POWER level; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Operation at or below this reduced THERMAL POWER level may continue provided that within the next 4 hours either:

a) The CEA group(s) with the inoperable position indicator is fully withdrawn while maintaining the withdrawal sequence required by Specification 3.1.3.6 and when this CEA group reaches its fully withdrawn position, the "Full Out" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully withdrawn. Subsequent to fully withdrawing this CEA group(s), the THERMAL POWER level may be returned to a level consistent with all other applicable specifications; or

LIMITING CONDITION FOR OPERATION (Continued)

b) The CEA group(s) with the inoperable indicator is fully inserted, and subsequently maintained fully inserted, while maintaining the withdrawal sequence and THERMAL POWER level required by Specification 3.1.3.6 and when this CEA group reaches its fully inserted position, the "Full In" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully inserted. Subsequent operation shall be within the limits of Specification 3.1.3.6.

4. If the failure of the position indicator channel(s) is during STARTUP, the CEA group(s) with the inoperable position indicator channel must be moved to the "Full Out" position and verified to be fully withdrawn via a "Full Out" indicator within 4 hours.

c. With a maximum of one reed switch position indicator channel per group or one pulse counting position indicator channel per group inoperable and the CEA(s) with the inoperable position indicator channel at either its fully inserted position or fully withdrawn position, operation may continue provided:

1. The position of this CEA is verified immediately and at least once per 12 hours thereafter by its "Full In" or "Full Out" limit (as applicable).

2. The fully inserted CEA group(s) containing the inoperable position channel is subsequently maintained fully inserted, and

3. Subsequent operation is within the limits of Specification 3.1.3.6.

d. With one or more pulse counting position indicator channels inoperable, operation in MODES 1 and 2 may continue for up to 24 hours provided all of the reed switch position indicator channels are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.1.3.3 Each position indicator channel shall be determined to be OPERABLE by verifying the pulse counting position indicator channels and the reed switch position indicator channels agree within 6 steps at least once per 12 hours.

CEA DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.4 The individual CEA drop time, from a fully withdrawn position, shall be $\leq$ 2.75 seconds from when electrical power is interrupted to the CEA drive mechanism until the CEA reaches its 90 percent insertion position with:

a. $T_{avg} \geq 515°F$, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

ACTION:

With the drop time of any CEA determined to exceed the above limit, restore the CEA drop time to within the above limit prior to proceeding to MODE 1 or 2.

SURVEILLANCE REQUIREMENTS

4.1.3.4 The CEA drop time shall be demonstrated through measurement prior to reactor criticality:

a. For all CEAs following each removal of the reactor vessel head,

b. For specifically affected individual CEAs following any maintenance on or modification to the CEA drive system which could affect the drop time of those specific CEAs, and

c. At least once per 18 months.

SHUTDOWN CEA INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown CEAs shall be withdrawn to $\geq$ 176 steps.

APPLICABILITY: MODE 1[1]
MODE 2[1],[2] with any regulating CEA not fully inserted.

ACTION:

INOPERABLE EQUIPMENT	REQUIRED ACTION
A. One or more shutdown CEAs not within limit.	A.1 Restore shutdown CEA(s) to within limit within 2 hours or otherwise be in MODE 3 within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Verify each shutdown CEA is withdrawan $\geq$ 176 steps at least once per 12 hours.

[1] This LCO is not applicable while performing Specification 4.1.3.1.2.

[2] See Special Test Exceptions 3.10.1 and 3.10.2.

REGULATING CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The power dependent insertion limit (PDIL) alarm circuit shall be OPERABLE, and the regulating CEA groups shall be limited to the withdrawal sequence and to the insertion limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY[1]: MODES 1[2] and 2[2],[3].

ACTION:

INOPERABLE EQUIPMENT	REQUIRED ACTION
A. Regulating CEA groups inserted beyond the Transient Insertion Limits provided in the CORE OPERATING LIMITS REPORT.	A.1 Restore regulating CEA groups to within limits specified in the CORE OPERATING LIMITS REPORT within 2 hours or otherwise be in MODE 3 within the next 6 hours. OR A.2 Reduce THERMAL POWER to less than or equal to the fraction of RATED THERMAL POWER allowed by the CEA group position and insertion limits specified in the CORE OPERATING LIMITS REPORT within 2 hours or otherwise be in MODE 3 within the next 6 hours.

[1] This LCO is not applicable while performing Specification 4.1.3.1.2.

[2] See Special Test Exceptions 3.10.1 and 3.10.2.

[3] With $K_{eff} \geq 1.0$

REGULATING CEA INSERTION LIMITS (Continued)

B. Regulating CEA groups inserted between the Long Term Steady State Insertion limit and the Transient Insertion Limit specified in the CORE OPERATING LIMITS REPORT for intervals > 4 hours per 24 hour interval.	B.1 Verify Short Term Steady State Insertion Limits as specified in the CORE OPERATING LIMITS REPORT are not exceeded within 15 minutes or otherwise be in MODE 3 within the next 6 hours. OR B.2 Restrict increases in THERMAL POWER to < 5% RATED THERMAL POWER per hour within 15 minutes or otherwise be in MODE 3 within the next 6 hours.
C. Regulating CEA groups inserted between the Long Term Steady State Insertion Limit and the Transient Insertion Limit specified in the CORE OPERATING LIMITS REPORT for intervals > 5 effective full power days (EFPD) per 30 EFPD or interval > 14 EFPD per 365 EFPD.	C.1 Restore regulating CEA groups to within the Long Term Steady State Insertion Limit specified in the CORE OPERATING LIMITS REPORT within 2 hours or otherwise be in MODE 3 within the next 6 hours.
D. PDIL alarm circuit inoperable.	D.1 Perform Specification 4.1.3.6.1 within 1 hour and once per 4 hours thereafter or otherwise be in MODE 3 within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6.1 Verify each regulating CEA group position is within the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT at least once per 12 hours. The provisions of Specification 4.0.4 are not applicable for entering into MODE 2 from MODE 3.

4.1.3.6.2 Verify the accumulated times during which the regulating CEA groups are inserted beyond the Steady State Insertion Limits but within the Transient Insertion Limits specified in the CORE OPERATING LIMITS REPORT at least once per 24 hours.

4.1.3.6.3 Verify PDIL alarm circuit is OPERABLE at least once per 31 days.

SURVEILLANCE REQUIREMENT (Continued)

4.2.1.2 Excore Detector Monitoring System[1] - The excore detector monitoring system may be used for monitoring the core power distribution by:

a. Verifying at least once per 12 hours that the CEAs are withdrawn to and maintained at or beyond the Long Term Steady State Insertion Limits of Specification 3.1.3.6.

b. Verifying at least once per 31 days that the AXIAL SHAPE INDEX alarm setpoints are adjusted to within the allowable limits specified in the CORE OPERATING LIMITS REPORT.

4.2.1.3 Incore Detector Monitoring System[2],[3] - The incore detector monitoring system may be used for monitoring the core power distribution by verifying that the incore detector Local Power Density alarms:

a. Are adjusted to satisfy the requirements of the core power distribution map which shall be updated at least once per 31 days.

b. Have their alarm setpoint adjusted to less than or equal to the limits specified in the CORE OPERATING LIMITS REPORT.

[1] Only required to be met when the Excore Detector Monitoring System is being used to determine Linear Heat Rate.

[2] Only required to be met when the Incore Detector Monitoring System is being used to determine Linear Heat Rate.

[3] Not required to be performed below 20% RATED THERMAL POWER.

POWER DISTRIBUTION LIMITS

TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR - F^T_r

LIMITING CONDITION FOR OPERATION

3.2.3 The calculated value of F^T_r shall be within the 100% power limit specified in the CORE OPERATING LIMITS REPORT. The F^T_r value shall include the effect of AZIMUTHAL POWER TILT.

APPLICABILITY: MODE 1 with THERMAL POWER >20% RTP*.

ACTION:

With F^T_r exceeding the 100% power limit within 6 hours either:

a. Reduce THERMAL POWER to bring the combination of THERMAL POWER and F^T_r to within the power dependent limit specified in the CORE OPERATING LIMITS REPORT and withdraw the CEAs to or beyond the Long Term Steady State Insertion Limits of Specification 3.1.3.6; or
b. Be in at least HOT STANDBY.

SURVEILLANCE REQUIREMENTS

4.2.3.1 The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 F^T_r shall be determined to be within the 100% power limit at the following intervals:

a. Prior to operation above 70 percent of RATED THERMAL POWER after each fuel loading,
b. At least once per 31 days of accumulated operation in Mode 1, and
c. Within four hours if the AZIMUTHAL POWER TILT (T_q) is > 0.020.

4.2.3.3 F^T_r shall be determined by using the incore detectors to obtain a power distribution map with all CEAs at or above the Long Term Steady State Insertion Limit for the existing Reactor Coolant Pump Combination.

*See Special Test Exception 3.10.2

POWER DISTRIBUTION LIMITS

AZIMUTHAL POWER TILT - T_q

LIMITING CONDITION FOR OPERATION

3.2.4 The AZIMUTHAL POWER TILT (T_q) shall be $\leq$ 0.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% of RATED THERMAL POWER[1].

ACTION:

a. With the indicated T_q > 0.02 but $\leq$ 0.10, either restore T_q to $\leq$ 0.02 within 2 hours or verify the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F^T_r) is within the limit of Specification 3.2.3 within 2 hours and once per 8 hours thereafter. Or otherwise, reduce THERMAL POWER to $\leq$ 50% of RATED THERMAL POWER within the next 4 hours.

b. With the indicated T_q > 0.10, perform the following actions:[2]
   1. Verify the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR (F^T_r) is within the limit of Specification 3.2.3 within 2 hours; and
   2. Reduce THERMAL POWER to $\leq$ 50% of RATED THERMAL POWER within 2 hours; and
   3. Restore $T_q \leq$ 0.02 prior to increasing THERMAL POWER. Correct the cause of the out of limit condition prior to increasing THERMAL POWER. Subsequent power operation above 50% of RATED THERMAL POWER may proceed provided that the measured T_q is verified $\leq$ 0.02 at least once per hour for 12 hours, or until verified at 95% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.2.4.1 Verify T_q is within limit at least once every 12 hours. The provisions of Specification 4.0.4 are not applicable for entering into MODE 1 with THERMAL POWER > 50% of RATED THERMAL POWER from MODE 1.

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[1] See Special Test Exception 3.10.2.

[2] All subsequent Required Actions must be completed if power reduction commences prior to restoring $T_q \leq$ 0.10.

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TABLE 3.3-1

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2 and *	1
2. Power Level - High	4	2(f)	3	1, 2, 3(d)	2
3. Reactor Coolant Flow - Low	4	2(a)	3	1, 2	2
4. Pressurizer Pressure - High	4	2	3	1, 2	2
5. Containment Pressure - High	4	2	3	1, 2	2
6. Steam Generator Pressure - Low	4	2(b)	3	1, 2	2
7. Steam Generator Water Level - Low	4	2	3	1, 2	2
8. Local Power Density - High	4	2(c)	3	1	2
9. Thermal Margin/Low Pressure	4	2(a)	3	1,2	2
10. Loss of Turbine - Hyraulic Fluid Pressure - Low	4	2(c)	3	1	2

Amendment No. 75, 118, 225,

TABLE 3.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Wide Range Logarithmic Neutron Flux Monitor - Shutdown	4	0	2	3,4,5	4
12. Underspeed - Reactor Coolant Pumps	4	2(a)	3	1,2	2

Amendment No. 15, 38, 57,

TABLE 3.3-1 (Continued)

TABLE NOTATION

*With the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal.

(a) Trip may be bypassed below 5% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is $\geq$ 5% of RATED THERMAL POWER.

(b) Trip may be manually bypassed when steam generator pressure is < 800 psia and all CEAs are fully inserted; bypass shall be automatically removed when steam generator pressure is $\geq$ 800 psia.

(c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is $\geq$ 15% of RATED THERMAL POWER.

(d) Trip does not need to be operable if all the control rod drive mechanisms are de-energized or if the RCS boron concentration is greater than or equal to the refueling concentration of Specification 3.9.1.

(e) DELETED

(f) ΔT Power input to trip may be bypassed below 5% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is $\geq$ 5% of RATED THERMAL POWER.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 4 hours and/or open the protective system trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel shall either be restored to OPERABLE status, or placed in the tripped condition, within 48 hours.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also declared inoperable, and the appropriate actions are taken for the affected functional units.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 48 hours, provided one of the inoperable channels is placed in the tripped condition.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION (SIAS)(d)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	1
b. Containment Pressure - High	4	2	3	1, 2, 3	2
c. Pressurizer Pressure - Low	4	2	3	1, 2, 3(a)	2
2. CONTAINMENT SPRAY (CSAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	1
b. Containment Pressure-- High - High	4	2(b)	3	1, 2, 3	2
3. CONTAINMENT ISOLATION (CIAS)					
a. Manual CIAS (Trip Buttons)	2	1	2	1, 2, 3, 4	1
b. Manual SIAS (Trip Buttons)	2	1	2	1, 2, 3, 4	1
c. Containment Pressure - High	4	2	3	1, 2, 3	2
d. Pressurizer Pressure - Low	4	2	3	1, 2, 3(a)	2

TABLE 3.3-3 (Continued)

TABLE NOTATION

(a) Trip function may be bypassed when pressurizer pressure is < 1850 psia; bypass shall be automatically removed when pressurizer pressure is ≥ 1850 psia.

(b) An SIAS signal is first necessary to enable CSAS logic.

(c) Trip function may be bypassed when steam generator pressure is < 700 psia; bypass shall be automatically removed when steam generator pressure is ≥ 700 psia.

(d) In MODE 4 the HPSI pumps are not required to start automatically on a SIAS.

(e) DELETED

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in COLD SHUTDOWN within the next 36 hours.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel shall either be restored to OPERABLE status, or placed in the tripped condition, within 48 hours.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also declared inoperable, and the appropriate actions are taken for the affected functional units.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 48 hours, provided one of the inoperable channels is placed in the tripped condition.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION

3.4.9.1 Reactor Coolant System (except the pressurizer) temperature, pressure, and heatup and cooldown rates shall be limited in accordance with the limits specified in Table 3.4-2 and shown on Figures 3.4-2a and 3.4-2b.

APPLICABILITY: At all times.

ACTION:

a. With any of the above limits exceeded in MODES 1, 2, 3, or 4, perform the following:

   1. Restore the temperature and/or pressure to within limit within 30 minutes.

      AND

   2. Perform an engineering evaluation to determine the effects of the out of limit condition on the structural integrity of the Reactor Coolant System and determine that the Reactor Coolant System remains acceptable for continued operation within 72 hours. Otherwise, be in at least MODE 3 within the next 6 hours and in MODE 5 with RCS pressure less than 300 psia within the following 30 hours.

b. With any of the above limits exceeded in other than MODES 1, 2, 3, or 4, perform the following:

   1. Immediately initiate action to restore the temperature and/or pressure to within limit.

      AND

   2. Perform an engineering evaluation to determine the effects of the out of limit condition on the structural integrity of the Reactor Coolant System and determine that the Reactor Coolant System is acceptable for continued operation prior to entering MODE 4.

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATIONS

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 sufficient to ensure that the more restrictive of following reactivity conditions is met:

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

b. A boron concentration of greater than or equal to 1720 ppm.

APPLICABILITY: MODE 6.

NOTE
Only applicable to the refueling canal when connected to the Reactor Coolant System

ACTION:

With the requirements of the above specification not satisfied, within 15 minutes suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 40 gpm of boric acid solution at or greater than the required refueling water storage tank concentration (ppm) 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 1720 ppm, whichever is the more restrictive.

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

4.9.1.2 The boron concentration of all filled portions 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 Deleted

3/4.10 SPECIAL TEST EXCEPTIONS

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.10.1 The requirement of Specifications 3.1.1.1, 3.1.3.5 and 3.1.3.6 may be suspended for measurement of CEA worth and shutdown margin provided reactivity equivalent to at least the highest estimated CEA worth (of those CEAs actually withdrawn) is available for trip insertion from OPERABLE CEA(s).

APPLICABILITY: MODES 2 and 3[1] during PHYSICS TESTS.

ACTION:

a. With any CEA not fully inserted and with less than the above reactivity equivalent available for trip insertion, within 15 minutes initiate and continue boration at > 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all CEAs inserted and the reactor subcritical by less than the above reactivity equivalent, immediately initiate and continue boration at > 40 gpm of boric acid solution at or greater than the required refueling water storage tank (RWST) concentration (ppm) until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

SURVEILLANCE REQUIREMENTS

4.10.1.1 The position of each CEA required either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each CEA not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position once within 7 days prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1[2].

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[1] Operation in MODE 3 shall be limited to 6 consecutive hours.

[2] Not required to be performed during initial power escalation following a refueling outage if SR 4.1.3.4 has been met.

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DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment building is designed and shall be maintained for a maximum internal pressure of 54 psig and an equilibrium liner temperature of 289°F.

PENETRATIONS

5.2.3 Penetrations through the reactor containment building are designed and shall be maintained in accordance with the design provisions contained in Section 5.2.8 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements.

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 217 fuel assemblies with each fuel assembly containing 176 rods. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.5 weight percent of U-235.

CONTROL ELEMENT ASSEMBLIES

5.3.2 The reactor core shall contain 73 control element assemblies. The control element assemblies shall be designed and maintained in accordance with the design provisions contained in Section 3.0 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

a. In accordance with the code requirements specified in Section 4.2.2 of the FSAR with allowance for normal degradation pursuant of the applicable Surveillance Requirements,

b. For a pressure of 2500 psia, and

c. For a temperature of 650°F except for the pressurizer which is 700°F.

3/4.1.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1.1 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS T_{avg}. The most restrictive condition occurs at EOL, with T_{avg} at no load operating temperature, and is associated with a postulated steam line break accident and resulting uncontrolled RCS cooldown. In the analysis of this accident, the minimum SHUTDOWN MARGIN specified in the CORE OPERATING LIMITS REPORT is initially required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN required by Specification 3.1.1.1 is based upon this limiting condition and is consistent with FSAR accident analysis assumptions. For earlier periods during the fuel cycle, this value is conservative. The SHUTDOWN MARGIN is verified by performing a reactivity balance calculation, considering the listed reactivity effects:

a. RCS boron concentration;
b. CEA positions;
c. RCS average temperature;
d. Fuel burnup based on gross thermal energy generation;
e. Xenon concentration; and
f. Samarium concentration.

3/4.1.1.2 REACTIVITY BALANCE

Reactivity balance is used as a measure of the predicted versus measured core reactivity during power operation. The periodic confirmation of core reactivity is necessary to ensure that Design Basis Accident (DBA) and transient safety analyses remain valid. A large reactivity difference could be the result of unanticipated changes in fuel, control element assembly (CEA) worth, or operation at conditions not consistent with those assumed in the predictions of core reactivity, and could potentially result in a loss of SHUTDOWN MARGIN (SDM) or violation of acceptable fuel design limits. Comparing predicted versus measured core reactivity validates the nuclear methods used in the safety analysis and supports the SDM demonstrations (LCO 3.1.1.1, "SHUTDOWN MARGIN (SDM)") in ensuring the reactor can be brought safely to cold, subcritical conditions.

The normalization of predicted RCS boron concentration to the measured value is typically performed after reaching RATED THERMAL POWER following startup from a refueling outage, with the CEAs in their normal positions for power operation. The normalization is performed at BOC conditions, so that core reactivity relative to predicted values can be continually monitored and evaluated as core conditions change during the cycle.

When measured core reactivity is within $\pm 1\%$ $\Delta k/k$ of the predicted value at steady state thermal conditions, the core is considered to be operating within acceptable design limits.

3/4.1.1 REACTIVITY CONTROL SYSTEMS (Continued)

3/4.1.1.2 REACTIVITY BALANCE (Continued)

The limits on core reactivity must be maintained during MODES 1 and 2 because a reactivity balance must exist when the reactor is critical or producing THERMAL POWER. This Specification does not apply in MODES 3, 4 and 5 because the reactor is shut down and the reactivity balance is not changing.

In MODE 6, fuel loading results in a continually changing core reactivity. Boron concentration requirements (LCO 3.9.1, "Boron Concentration") ensure that fuel movements are performed within the bounds of the safety analysis.

3/4.1.1.3 BORON DILUTION

A minimum flow rate of at least 1000 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual during reductions in Reactor Coolant System boron concentration. The 1000 GPM limit is the minimum required shutdown cooling flow to satisfy the boron dilution accident analysis. This 1000 GPM flow is an analytical limit. Plant operating procedures maintain the minimum shutdown cooling flow at a higher value to accommodate flow measurement uncertainties. While the plant is operating in reduced inventory operations, plant operating procedures also specify an upper flow limit to prevent vortexing in the shutdown cooling system. A flow rate of at least 1000 GPM will circulate the full Reactor Coolant System volume in approximately 90 minutes. With the RCS in mid-loop operation, the Reactor Coolant System volume will circulate in approximately 25 minutes. The reactivity change rate associated with reductions in Reactor Coolant System boron concentration will be within the capability for operator recognition and control.

3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC)

The limitations on MTC are provided to ensure that the assumptions used in the accident and transient analyses remain valid through each fuel cycle. The surveillance requirements for measurement of the MTC during each fuel cycle are adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured MTC value is within its limit provides assurance that the coefficient will be maintained within acceptable values throughout each fuel cycle.

3/4.1.2 BORATION SYSTEMS (Continued)

The provision in Specification 3.1.2.4 that Specifications 3.0.4 and 4.0.4 are not applicable for entry into MODE 4 is provided to allow for closing the motor circuit breaker and subsequent testing of the inoperable charging pump. Specification 3.4.9.3, which is applicable to MODES 5 and 6, requires that one charging pump be capable of injecting into the RCS at or below 190°F. Specification 3.1.2.4 requires that at least two charging pumps be OPERABLE in MODES 1, 2, 3, and 4. The exception from Specification 3.0.4 and 4.0.4 will allow Millstone Unit No. 2 to enter into MODE 4 and test the inoperable charging pump and declare it OPERABLE.

Surveillance Requirement (SR) 4.1.2.2.a requires all testable power operated valves in each required flow path to be exercised through one complete cycle at least once per 7 days. This surveillance requirement does not apply to 2-CS-13.1B. This motor operated valve is in the RWST supply to the charging pumps and the RWST supply to the Facility 2 emergency core cooling pumps (HPSI, LPSI, and CS). It is key-locked in the open position during normal plant operation. This valve is not in the boration flow path when it is in the normal locked open position, and it is a non-testable valve in Modes 1 through 4 for boration flow path verification due to the increase in plant risk with no offsetting improvement in plant safety. Therefore, it is not necessary to stroke this valve at least once per 7 days for the boration flow path verification required by SR 4.1.2.2.a. However, for additional assurance, 2-CS-13.1B should be verified locked open when performing SR 4.1.2.2.a.

3/4.1.3 MOVEABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met.

3/4.1.3 MOVEABLE CONTROL ASSEMBLIES (Continued)

A CEA may become misaligned, yet remain trippable. In this condition, the CEA can still perform its required function of adding negative reactivity should a reactor trip be necessary. If one or more CEAs (regulating or shutdown) are misaligned by > 10 steps and $\leq$ 20 steps but trippable, or one CEA is misaligned by > 20 steps but trippable, continued operation in MODES 1 and 2 may continue, provided, within 1 hour, the power is reduced to < 70% RATED THERMAL POWER, and within 2 hours CEA alignment is restored. If negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Regulating CEA alignment can be restored by either aligning the misaligned CEA(s) to within 10 steps of its group or aligning the misaligned CEA's group to within 10 steps of the misaligned CEA. A Regulating CEA is considered fully inserted when either the Dropped Rod indication or lower Electrical Limit indication lights on the core mimic display are illuminated. A Regulating CEA is considered to be fully withdrawn when withdrawn $\geq$ 176 steps. Shutdown CEA alignment can only be restored by aligning the misaligned CEA(s) to within 10 steps of its group.

Xenon redistribution in the core starts to occur as soon as a CEA becomes misaligned. Reducing THERMAL POWER ensures acceptable power distributions are maintained. For small misalignments (< 20 steps) of the CEAs, there is:

a. A small effect on the time dependent long term power distributions relative to those used in generating LCOs and limiting safety system settings (LSSS) setpoints;

b. A negligible effect on the available SHUTDOWN MARGIN; and

c. A small effect on the ejected CEA worth used in the accident analysis.

With a large CEA misalignment (> 20 steps), however, this misalignment would cause distortion of the core power distribution. This distortion may, in turn, have a significant effect on the time dependent, long term power distributions relative to those used in generating LCOs and LSSS setpoints. The effect on the available SHUTDOWN MARGIN and the ejected CEA worth used in the accident analysis remain small. Therefore, this condition is limited to a single CEA misalignment, while still allowing 2 hours for recovery.

In both cases, a 2 hour time period is sufficient to:

a. Identify cause of a misaligned CEA;

b. Take appropriate corrective action to realign the CEAs; and

c. Minimize the effects of xenon redistribution.

If a CEA is untrippable, it is not available for reactivity insertion during a reactor trip. With an untrippable CEA, meeting the insertion limits of LCO 3.1.3.5 and LCO 3.1.3.6 does not ensure that adequate SHUTDOWN MARGIN exists. With one or more CEAs untrippable the plant is transitioned to MODE 3 within 6 hours.

3/4.1.3 MOVEABLE CONTROL ASSEMBLIES (Continued)

The CEA motion inhibit permits CEA motion within the requirements of LCO 3.1.3.6, "Regulating Control Element Assembly (CEA) Insertion Limits," and the CEA deviation circuit prevents regulating CEAs from being misaligned from other CEAs in the group. With the CEA motion inhibit inoperable, a time of 6 hours is allowed for restoring the CEA motion inhibit to OPERABLE status, or placing and maintaining the CEA drive switch in either the "off" or "manual" position, fully withdrawing all CEAs in group 7 to < 5% insertion. Placing the CEA drive switch in the "off" or "manual" position ensures the CEAs will not move in response to Reactor Regulating System automatic motion commands. Withdrawal of the CEAs to the positions required in the Required Action B.2 ensures that core perturbations in local burnup, perking factors, and SHUTDOWN MARGIN will not be more adverse than the Conditions assumed in the safety analyses and LCO setpoint determination. Required Action B.2 is modified by a Note indicating that performing this Required Action is not required when in conflict with Required Actions A.1 or C.1.

Continued operation is not allowed in the case of more than one CEA misaligned from any other CEA in its group by > 20 steps, or one or more CEAs untrippable. This is because these cases are indicative of a loss of SHUTDOWN MARGIN and power distribution changes, and a loss of safety function, respectively.

Operability of the CEA position indicators (Specification 3.1.3.3) is required to determine CEA positions and thereby ensure compliance with the CEA alignment and insertion limits and ensures proper operation of the CEA Motion Inhibit and CEA deviation block circuit. The CEA "Full In" and "Full Out" limit Position Indicator channels provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the ACTION statements applicable to inoperable CEA position indicators permit continued operations when the positions of CEAs with inoperable position indicators can be verified by the "Full In" or "Full Out" limit Position Indicator channels.

CEA positions and OPERABILITY of the CEA position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied.

The maximum CEA drop time permitted by Specification 3.1.3.4 is the assumed CEA drop time used in the accident analyses. Measurement with $T_{avg} \geq 515°F$ and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES (Continued)

The LSSS setpoints and the power distribution LCOs were generated based upon a core burnup which would be achieved with the core operating in an essentially unrodded configuration. Therefore, the CEA insertion limit specifications require that during MODES 1 and 2, the CEAs be nearly fully withdrawn. The amount of CEA insertion permitted by the Long Term Steady State Insertion Limits of Specification 3.1.3.6 will not have a significant effect upon the unrodded burnup assumption but will still provide sufficient reactivity control. The Transient Insertion Limits of Specification 3.1.3.6 are provided to ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels; however, long term operation at these insertion limits could have adverse effects on core power distribution during subsequent operation in an unrodded configuration. The PDIL alarm, CEA Motion Inhibit and CEA deviation circuit are provided by the CEAPDS computer.

The control rod drive mechanism requirement of specification 3.1.3.7 is provided to assure that the consequences of an uncontrolled CEA withdrawal from subcritical transient will stay within acceptable levels. This specification assures that reactor coolant system conditions exist which are consistent with the plant safety analysis prior to energizing the control rod drive mechanisms. The accident is precluded when conditions exist which are inconsistent with the safety analysis since deenergized drive mechanisms cannot withdraw a CEA. The drive mechanisms may be energized with the boron concentration greater than or equal to the refueling concentration since, under these conditions, adequate SHUTDOWN MARGIN is maintained, even if all CEAs are fully withdrawn from the core.

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System and the Incore Detector Monitoring System, provide adequate monitoring of the core power distribution and are capable of verifying that the linear heat rate does not exceed its limits. The Excore Detector Monitoring System performs this function by continuously monitoring the AXIAL SHAPE INDEX with two OPERABLE excore neutron flux detectors and verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits specified in the Core Operating Limits Report using the Power Ratio Recorder. The power dependent limits of the Power Ratio Recorder are less than or equal to the limits specified in the Core Operating Limits Report. In conjunction with the use of the excore monitoring system and in establishing the AXIAL SHAPE INDEX limits, the following assumptions are made: 1) the CEA insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are satisfied, 2) the AZIMUTHAL POWER TILT restrictions of Specification 3.2.4 are satisfied, and 3) the TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTOR does not exceed the limits of Specification 3.2.3.

The Incore Detector Monitoring System continuously provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments ensure that the peak linear heat rates will be maintained within the allowable limits specified in the Core Operating Limits Report. The setpoints for these alarms include allowances, set in the conservative direction. The Incore Detector Monitoring System is not used to monitor linear heat rate below 20% of RATED THERMAL POWER. The accuracy of the neutron flux information from the incore detectors is not reliable at THERMAL POWER < 20% RATED THERMAL POWER.

3/4.2.3 and 3/4.2.4 TOTAL UNRODDED INTEGRATED RADIAL PEAKING FACTORS F^T_r AND AZIMUTHAL POWER TILT - T_q

The limitations on F^T_r and T_q are provided to 1) ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local power Density - High LCOs and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits, and, 2) ensure that the assumptions used in the analysis establishing the DNB Margin LCO, and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If F^T_r or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed

by the ACTION statements since these additional restrictions provide adequate provisions to assure that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density - High LCOs and LSSS setpoints remain valid. An AZIMUTHAL POWER TILT > 0.10 is not expected and if it should occur, subsequent operation would be restricted to only those operations required to identify the cause of this unexpected tilt.

Core power distribution is a concern any time the reactor is critical. The Total Integrated Radial Peaking Factor - F^T_r LCO, however, is only applicable in MODE 1 above 20% of RATED THERMAL POWER. The reasons that this LCO is not applicable below 20% of RATED THERMAL POWER are:

a. Data from the incore detectors are used for determining the measured radial peaking factors. Technical Specification 3.2.3 is not applicable below 20% of RATED THERMAL POWER because the accuracy of the neutron flux information from the incore detectors is not reliable at THERMAL POWER < 20% RATED THERMAL POWER.

b. When core power is below 20% of RATED THERMAL POWER, the core is operating well below its thermal limits, and the Local Power Density (fuel pellet melting) and Thermal Margin/Low Pressure (DNB) trips are highly conservative.

The surveillance requirements for verifying that F^T_r and T_q are within their limits provide assurance that the actual values of F^T_r and T_q do not exceed the assumed values. Verifying F^T_r after each fuel loading prior to exceeding 70% of RATED THERMAL POWER provides additional assurance that the core was properly loaded.

3/4.2.6 DNB MARGIN

The limitations provided in this specification ensure that the assumed margins to DNB are maintained. The limiting values of the parameters in this specification are those assumed as the initial conditions in the accident and transient analyses; therefore, operation must be maintained within the specified limits for the accident and transient analyses to remain valid.

3/4.10 SPECIAL TEST EXCEPTIONS

BASES

3/4.10.1 SHUTDOWN MARGIN

This special test exception provides that a minimum amount of CEA worth is immediately available for reactivity control or that the reactor is sufficiently subcritical so as to provide safe operating conditions when tests are performed for CEA worth measurement. This special test exception is required to permit the periodic verification of the actual versus predicted core reactivity condition occuring as a result of fuel burnup or fuel cycling operations.

3/4.10.2 GROUP HEIGHT AND INSERTION LIMITS

This special test exception permits individual CEAs to be positioned outside of their normal group heights and insertion limits during the performance of such PHYSICS TESTS as those required to 1) measure CEA worth and 2) determine the reactor stability index and damping factor under xenon oscillation conditions.