Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-20-003

March 27, 2020

10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, 52, and 68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Application for Technical Specifications Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (BFN-TS-516)**

References:

1. Technical Specification Task Force Improved Standard Technical Specifications Change Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b," dated March 18, 2009 (ML090850642)

2. NRC Letter to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 - Issuance of Amendment Nos. 311, 334, and 294 to Adopt Technical Specifications Task Force Traveler, TSTF-542, Revision 2, 'Reactor Pressure Vessel Water Inventory Control' (EPID L-2019-LLA-0010)," dated December 26, 2019 (ML19294A011)

In accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) is submitting a request for an amendment to the Technical Specifications (TS) for the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3. The proposed amendment would modify the BFN TS by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies." The changes are consistent with Nuclear Regulatory Commission (NRC) approved Technical Specification Task Force (TSTF) Standard Technical Specifications Change TSTF-425, Revision 3 (Reference 1). The *Federal Register* notice published on July 6, 2009 (74 FR 31996), announced the availability of this TS improvement.

Attachment 1 provides a description of the proposed change, the requested confirmation of applicability, and plant-specific variations. Attachment 2 provides documentation of Probabilistic Risk Assessment technical adequacy. Attachments 3.1, 3.2, and 3.3 provide the existing BFN Unit 1, 2, and 3 TS pages, respectively, marked up to show the proposed change. Attachments 4.1, 4.2, and 4.3 provide revised (clean) TS pages. Attachment 5 provides the proposed TS Bases changes for BFN Unit 1 for information only (the Unit 2 and 3 Bases are nearly identical in terms of what is being affected by adoption of TSTF-425). Attachment 6 provides the proposed No Significant Hazards Consideration. Attachment 7 provides a cross-reference table comparing the TSTF-425 (NUREG-1433) changes versus the BFN TS changes.

TVA requests approval of the proposed license amendment by one year from the date of this letter. In Reference 2, the NRC issued License Amendments 311, 334, and 294 for BFN Unit 1, 2, and 3, respectively, for the adoption of TSTF-542, "RPV Water Inventory Control." These amendments resulted in 16 interfacing Surveillance Requirements (SR) all of whose Frequencies are candidates for relocation to the Surveillance Frequency Control Program (SFCP) in accordance with the model safety evaluation in the above cited *Federal Register* notice. Implementation of those License Amendments is scheduled for prior to the start of the interval beginning with the BFN Unit 3 Spring 2022 Cycle 20 refueling outage. Therefore, it would be inappropriate to implement the SFCP for these SRs in advance of the License Amendment 311, 334, and 294 implementation date. Accordingly, TVA will implement the proposed changes prior to beginning of the BFN Unit 3 Spring 2022 Cycle 20 refueling outage for the following SRs concurrent with License Amendment 311, 334, and 294 implementation:

- SR 3.3.5.1.3 (SR 3.3.5.1.4 and 3.3.5.1.5 are being deleted as redundant)
- SRs 3.3.5.2.1 and 3.3.5.2.2
- SRs 3.3.5.3.1, 3.3.5.3.2, 3.3.5.3.3, and 3.3.5.3.4
- SRs 3.3.7.1.3, 3.3.7.1.4 (SR 3.3.7.1.5 and 3.3.7.1.6 are being deleted as redundant)
- SRs 3.5.2.1, 3.5.2.2, 3.5.2.3, 3.5.2.4, 3.5.2.5, 3.5.2.6, and 3.5.2.7

For the balance of the affected SRs, TVA will implement the changes within 60 days of receipt of the license amendment.

TVA has determined that there is no significant hazards consideration associated with the proposed change and that the TS change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). In accordance with 10 CFR 50.91, "Notice for Public Comment; State Consultation," a copy of this application, with attachments is being provided to the Alabama State Department of Public Health.

There are no new regulatory commitments contained in this submittal. Please address any questions regarding this submittal to Kimberly D. Hulvey, Fleet Licensing Manager, at (423) 751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 27th day of March 2020.

Respectfully,

James Barstow
Vice President, Nuclear Regulatory Affairs & Site Support

Attachments:
1 Description and Assessment
2 Documentation of Probabilistic Risk Assessment Technical Adequacy
3.1 Proposed Technical Specification Changes (Unit 1 Markup)
3.2 Proposed Technical Specification Changes (Unit 2 Markup)
3.3 Proposed Technical Specification Changes (Unit 3 Markup)
4.1 Revised Technical Specification Pages (Unit 1 Re-Typed)
4.2 Revised Technical Specification Pages (Unit 2 Re-Typed)
4.3 Revised Technical Specification Pages (Unit 3 Re-Typed)
5. Proposed Technical Specification Bases Changes (Unit 1 For Information Only)
6. Proposed No Significant Hazards Consideration
7. TSTF-425 (NUREG-1433) Versus BFN TS Cross-Reference

cc (w/Attachments):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Browns Ferry Nuclear Plant
NRC Project Manager – Browns Ferry Nuclear Plant
State Health Officer, Alabama State Department of Health

Attachment 1

Description and Assessment

Subject: Application for Technical Specifications Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (BFN-TS-516)

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Facility Operating Licenses DPR-33, 52, and 68 for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, respectively. The proposed amendment would modify Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the adoption of Technical Specification Task Force (TSTF) Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b."

Additionally, the change would add a new program, the Surveillance Frequency Control Program (SFCP), to TS Section 5.0, Administrative Controls.

The changes are consistent with Nuclear Regulatory Commission (NRC) approved Industry TSTF Standard Technical Specifications (STS) change TSTF-425, Revision 3, (ML090850642). The *Federal Register* notice published on July 6, 2009, announced the availability of this TS improvement.

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

The Tennessee Valley Authority (TVA) has reviewed the model safety evaluation dated July 6, 2009 (74 FR 31996). This review included a review of the NRC staff's evaluation, TSTF-425, Revision 3, and the requirements specified in NEI 04-10, Revision 1, (ML071360456).

Attachment 2 to this submittal includes BFN documentation with regard to Probabilistic Risk Assessment (PRA) technical adequacy consistent with the requirements of Regulatory Guide 1.200, Revision 2, Section 4.2, and describes any PRA models without NRC-endorsed standards, including documentation of the quality characteristics of those models in accordance with Regulatory Guide 1.200.

TVA has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to BFN and justify this amendment to incorporate the changes to the BFN TS.

2.2 Optional Changes and Variations

The proposed amendment is consistent with the STS changes described in TSTF-425, Revision 3, with variations or deviations from TSTF-425, as identified below and may include differing TS Surveillance Requirement (SR) numbers. A cross-reference of the TSTF-425 SRs versus the BFN SRs is provided in Attachment 7. Attachment 7

provides individual dispositions of each STS and BFN change. Where the changes are identical, a disposition of “No variation” is provided. Similarly, differences due to bracketed information in TSTF-425 compared with unbracketed BFN site-specific information is not a variation. Where a variation is taken, the disposition provides a cross-reference to the paragraph in this Attachment that provides justification.

2.2.1 Administrative Variations

The following variations taken from the TSTF-425 template for NUREG-1433 are considered to be administrative in nature. A cross-reference of the TSTF-425 SRs versus the BFN SRs is included in Attachment 7.

2.2.1.1 BFN SRs with SR numbers that differ from the corresponding General Electric BWR/4 STS (NUREG-1433) Surveillances, have wording that is slightly different, and have differing existing Frequencies with a similar testing intent are administrative variations from TSTF-425 with no effect on the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996). Attachment 7 itemizes these variations.

2.2.1.2 For NUREG-1433 surveillances that are not contained in the BFN TS, the corresponding NUREG-1433 mark-ups included in TSTF-425 for these SRs are not applicable to BFN. These are administrative variations from TSTF-425 with no effect on the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996).

2.2.1.3 Various TSTF-425 Section 3.3 instrumentation surveillances are invoked by Instrumentation Functions contained in tables. The analogous BFN SRs may have different SR numbers, slightly different wording, and may be invoked by a different set of Functions. These are administrative variations from TSTF-425 with no effect on the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996).

2.2.1.4 STS SRs 3.4.3.1, 3.5.1.7, 3.6.1.3.6, 3.6.1.3.8, and 3.6.2.3.2 have a Frequency of “In accordance with the Inservice Testing Program or [either 92 days or 18 months]” which made these SRs eligible for the SFCP. Analogous BFN SRs 3.4.3.1, 3.5.1.6, 3.6.1.3.5, 3.6.1.3.6, and 3.6.2.3.2 have a Frequency of “In accordance with the Inservice Testing Program” which is ineligible for the SFCP per the criteria of the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996). Similarly, STS SR 3.6.1.8.2 has a 31-day Frequency that is eligible for control under the SFCP, while the analogous BFN SR 3.6.1.6.2 Frequency is “In accordance with the Inservice Testing Program” which is ineligible for the SFCP.

2.2.1.5 Various BFN plant-specific SRs with fixed periodic Frequencies are not contained in NUREG-1433, and therefore, are not included in the NUREG-1433 mark-ups provided in TSTF-425. TVA has assessed these SRs and determined that the relocation of the Frequencies for these SRs is consistent with TSTF-425, Revision 3, and with the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996), based on the scope exclusions identified in Section 1.0, “Introduction,” of the model safety evaluation. In accordance with TSTF-425, changes to the Frequencies for these SRs are proposed to be controlled under the SFCP.

2.2.1.6 STS SR 3.5.2.1 verifies sufficient suppression pool water level for LPCI operation. STS SR 3.5.2.2 verifies sufficient suppression pool or condensate storage tank (CST) water level for Core Spray operation. BFN SR 3.5.2.2 captures both of these STS SRs

(without the provision for Core Spray alignment to the CST). The Frequency of BFN SR 3.5.2.2 will be in accordance with the SFCP.

2.2.1.7 The TS Bases insert provided in TSTF-425 to replace text describing the basis for each frequency relocated to the SFCP has been revised from “The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program” to read “The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.” This variation is consistent with NUREG-1433, Revision 4, with the NRC letter dated April 14, 2010 (ML100990099), and with the NRC-supported changes to the letter in a subsequent discussion with the TSTF.

2.2.1.8 Various formatting changes were made, such as revising the footers of various pages in the TS markups to promote consistency, inserting new pages due to text rollover, and punctuation corrections on affected SRs. These are administrative changes not depicted in TSTF-425.

2.2.1.9 BFN SR 3.8.4.2 specifies:

> Verify each required battery charger charges its respective battery after the battery’s 24 month service test.

The “24 month service test” correlates to BFN SR 3.8.4.3, whose 24 month Frequency is being changed to the SFCP. It is therefore appropriate to delete the Frequency reference in SR 3.8.4.2. STS does not contain an analogous SR; therefore, this is an administrative variation not depicted in TSTF-425.

2.2.2 Technical Changes

2.2.2.1 In TS Section 3.3, as a result of replacing the SR Frequencies to “In accordance with the Surveillance Frequency Control Program” (for SRs that previously had different Frequencies), there will now be a number of SRs that are either exactly replicated within a single TS (e.g., “Perform CHANNEL CHECK,” “Perform CHANNEL FUNCTIONAL TEST,” and “Perform CHANNEL CALIBRATION”). In these cases, the replicated SR numbers are retained, but the text in the SURVEILLANCE column is replaced with “(Deleted)” (unless the deleted SR occurs at the end of the Surveillance Table whereupon it will be removed), and similar SR adjustments are made in the instrumentation tables for the affected Functions. While these are esentially administrative changes to these SRs, these are considered to be technical variations because there is no specific provision for this in TSTF-425 or the Model Safety Evaluation. This variation is applicable to:

- SR 3.3.1.1.4 (retained), 3.3.1.1.8 (deleted), and 3.3.1.1.12 (deleted): Perform CHANNEL FUNCTIONAL TEST
- SR 3.3.1.2.1 (retained) and 3.3.1.2.3 (deleted): Perform CHANNEL CHECK
- SR 3.3.5.1.3 (retained), 3.3.5.1.4 (deleted), and 3.3.5.1.5 (deleted): Perform CHANNEL CALIBRATION
- SR 3.3.7.1.3 (retained) and 3.3.7.1.5 (deleted): Perform CHANNEL CALIBRATION
- SR 3.3.7.1.4 (retained) and 3.3.7.1.6 (deleted): Perform LOGIC SYSTEM FUNCTIONAL TEST

- SR 3.3.8.1.1 (retained) and 3.3.8.1.2 (deleted): Perform CHANNEL CALIBRATION.

2.2.2.2 TVA is taking this opportunity to correct an issue involving two existing SRs. SR 3.3.6.1.3 and 3.3.6.1.4 specify performing a Channel Calibration with a Frequency of 92 days and 122 days, respectively. However, neither of these SRs are currently assigned to the Surveillance Requirements Column for any of the Functions contained on Table 3.3.6.1-1. This stemmed from a series of unit-specific licensing actions associated with the shift to a 24-month fuel cycle, as well as the startup of BFN1, that resulted in SR 3.3.6.1.5 performing all of the Channel Calibrations required by Table 3.3.6.1-1. Accordingly, TVA is deleting SRs 3.3.6.1.3 and 3.3.6.1.4, as these Channel Calibration Frequencies are no longer required.

2.2.2.3 The following two SRs are candidates for having a Frequency in accordance with the SFCP:

- SR 3.3.3.1.3 – Perform CHANNEL CALIBRATION of the Reactor Pressure Functions
- SR 3.3.3.1.4 – Perform CHANNEL CALIBRATION for each required PAM instrumentation channel except for the Reactor Pressure Function

While the respective Frequencies of 184 days and 24 months, will be retained within the SFCP for the applicable Post-Accident Monitoring (PAM) functions, it is no longer necessary to replicate these SRs in the TS. Accordingly, SR 3.3.3.1.3 is revised to read: "Perform CHANNEL CALIBRATION," and SR 3.3.3.1.4 is being deleted. This will make SR 3.3.3.1.3 align with STS SR 3.3.3.1.2.

2.2.2.4 The following two SRs are candidates for having a Frequency in accordance with the SFCP:

- SR 3.3.3.2.2 – Perform CHANNEL CALIBRATION for the Suppression Pool Water Level Function
- SR 3.3.3.2.3 – Perform CHANNEL CALIBRATION for each required instrumentation channel except for the Suppression Pool Water Level Function

These SRs refer to the Backup Control System Functions listed in TS Bases Table B 3.3.3.2-1 and have the same 24 month Frequency. It is not necessary to replicate these SRs in the TS. Accordingly, SR 3.3.3.2.2 is revised to read: "Perform CHANNEL CALIBRATION for each required instrumentation channel," and SR 3.3.3.2.3 is being deleted. This will make SR 3.3.3.2.2 align with STS SR 3.3.3.2.3.

2.2.2.5 BFN TS SR 3.8.4.3, Note, is being revised to delete the frequency of "once per 60 months." This change allows the modified performance discharge test in BFN TS SR 3.8.4.4 to be performed in lieu of the service test in BF TS SR 3.8.4.3 at the Frequency established in the SFCP.

Consistent with Institute of Electrical and Electronics Engineers (IEEE) 450-1995 (Reference 7 in Technical Specifications Bases 3.8.4), a modified performance discharge test encompasses the duty cycle of the service test. SRs 3.8.4.3 and 3.8.4.4 specify that the service test and modified performance test are encompassed

by the duty cycle requirements. As stated in IEEE 450-1995, Section 5.4, “A modified performance test can be used in lieu of a service test at any time.” The modified performance discharge test is a simulated duty cycle consisting of just two rates; the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test. Both tests envelop the duty cycle of the service test. Therefore, either a service test or modified performance discharge test verify battery capacity to support the design basis load profile. This is consistent with the change accepted for Cooper Nuclear Station, dated March 31, 2017 (ML16110A425).

2.3 Bases Changes

Revised TS Bases are provided in Attachment 5 for NRC information. Only the BFN Unit 1 TS Bases markups are provided, as the BFN Unit 2 and 3 changes are nearly identical in terms of the TSTF-425-driven changes being made. These Bases revisions will be incorporated as an implementing action pursuant to TS 5.5.10, “Technical Specifications (TS) Bases Control Program,” following issuance of the amendment. The TS Bases for pages provided in Attachment 5 are typically revised by replacing frequency explanations with the statement, “The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.”

3.0 REGULATORY ANALYSIS

3.1 Applicable Regulatory Requirements and Criteria

A description of the proposed changes and their relationship to applicable regulatory Requirements is provided in TSTF-425, Revision 3, and the NRC staff's Model Safety Evaluation published in the Notice of Availability dated July 6, 2009 (74 FR 31996). TVA has concluded that the relationship of the proposed changes to the applicable regulatory requirements presented in the *Federal Register* notice is applicable to BFN.

3.2 Precedent

This application is being made in accordance with the TSTF-425, Revision 3, (ML090850642). TVA is not proposing significant variations or deviations from the TS changes described in TSTF-425 or in the content of the NRC staff's Model Safety Evaluation published on July 6, 2009 (74 FR 31996). The NRC has previously approved license amendments to the TS to adopt TSTF-425. The most recent examples for Boiling Water Reactor Type 4 (BWR/4) plants include: Brunswick Steam Electric Plant, Unit 1 and 2, dated May 24, 2017 (ML17096A129), and Cooper Nuclear Station, dated March 31, 2017 (ML17061A050).

The subject License Amendment Request proposes to relocate periodic surveillance frequencies to a licensee-controlled program and add a new program (the Surveillance Frequency Control Program) to the Administrative Controls section of TS in accordance with TSTF-425 and as discussed in the previously approved amendments.

3.3 No Significant Hazards Consideration

TVA has reviewed the proposed no significant hazards consideration determination (NSHC) published in the *Federal Register* on July 6, 2009 (74 FR 31996). TVA has

concluded that the proposed NSHC, which satisfies the requirement of 10 CFR 50.91(a), presented in the *Federal Register* notice is applicable to BFN and is provided as Attachment 6 to this amendment request.

3.4 Conclusion

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

4.0 ENVIRONMENTAL CONSIDERATION

TVA has reviewed the environmental consideration included in the NRC's model safety evaluation published in the *Federal Register* on July 6, 2009 (74 FR 31996). TVA has concluded that the NRC's findings presented therein are applicable to BFN, and the determination is hereby incorporated by reference for this application.

Attachment 2 to CNL-20-003

Documentation of Probabilistic Risk Assessment Technical Adequacy
(62 pages)

TABLE OF CONTENTS

LIST OF TABLES

1. Overview

The implementation of the Surveillance Frequency Control Program (also referred to as Risk-Informed Technical Specifications Initiative 5b) at Browns Ferry Nuclear (BFN) Power Plant will follow the guidance provided in Nuclear Energy Institute (NEI) 04-10, Revision 1 in evaluating proposed surveillance test interval (STI), also referred to as "surveillance frequency" changes.

2. SCOPE

The following steps of the risk-informed STI revision process are common to the proposed changes to all STIs within the proposed licensee-controlled program.

- Each STI revision will be reviewed to determine whether there are any commitments made to the Nuclear Regulatory Commission (NRC) that may prohibit changing the interval. If there are no related commitments, or the commitments may be changed using a commitment change process based on NRC endorsed guidance, then evaluation of the STI revision would proceed. If a commitment exists and the commitment change process does not permit the change, then the STI revision would not be implemented.

- A qualitative analysis will be performed for each STI revision that involves several considerations including, STI performance history, industry operating experience (OE), impact on defense-in-depth, and others as outlined by NEI 04-10.

- Each STI revision will be reviewed by an Expert Panel, referred to as the Integrated Decision-making Panel (IDP), which is similar to the Maintenance Rule implementation, which includes personnel with experience in surveillance tests and system or component reliability. If the IDP approves the STI revision, the change is documented and implemented, and available for audit by the NRC. If the IDP does not approve the STI revision, the STI value is left unchanged.

- Performance monitoring will be conducted as recommended by the IDP. In some cases, no additional monitoring may be necessary beyond that already conducted under the Maintenance Rule. The performance monitoring will help to confirm that no failure mechanisms related to the revised test interval become important enough to alter the information provided for the justification of the interval changes.

- The IDP will be responsible for periodic review of performance monitoring results. If it is determined that the time interval between successive performances of a surveillance test is a factor in the unsatisfactory performances of the surveillance, the IDP will return the STI back to the previously acceptable STI.

- In addition to the above steps, the Probabilistic Risk Assessment (PRA) will be used when possible to quantify the effect of a proposed individual STI revision compared to acceptance criteria in NEI 04-10. For non-modeled hazards, a qualitative or bounding assessment will be performed. Additionally, the cumulative impact on Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) from all risk-informed STI

revisions that have not been rolled into the Model of Record (MOR) will be compared to the risk acceptance criteria as delineated in NEI 04-10.

The NEI 04-10 methodology is consistent with the guidance provided in Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." The guidance in RG 1.200 indicates that the following steps should be followed when performing PRA assessments (Note: Because of the broad scope of potential Initiative 5b applications and the fact that the risk assessment details will differ from application to application, each of the issues encompassed in Items 1 through 3 below will be covered in the PRA assessment made in support of the individual STI interval change requests. Item 3 satisfies one of the requirements of Section 4.2 of RG 1.200. The remaining requirements of Section 4.2 are addressed by Item 4 below):

1. Identify the parts of the PRA used to support the application

    - Systems, Structures and Components, operational characteristics affected by the application and how these are implemented in the PRA model.
    - A definition of the acceptance criteria (e.g., change in CDF and LERF) used for the application.

2. Identify the scope of risk contributors addressed by the PRA model

    - If not full scope (i.e., internal and external), identify appropriate compensatory measures or provide bounding arguments to address the risk contributors not addressed by the model.

3. Summarize the risk assessment methodology used to address the risk of the application

    - Include how the PRA model was modified to appropriately model the risk impact of the change request.

4. Demonstrate the technical adequacy of the PRA

    - Identify plant changes (design or operational practices) that have been incorporated at the site, but are not yet in the PRA model and justify why the change does not impact the PRA results used to support the application.
    - Document peer review findings and observations that are applicable to the parts of the PRA required for the application, and for those that have not yet been addressed, justify why the significant contributors would not be impacted.
    - Document that the parts of the PRA used in the decision are consistent with the ASME/ANS (RA-Sa-2009) PRA standard endorsed by RG 1.200. Provide justification to show that where specific requirements in the standard are not adequately met, and that it will not unduly impact the results.
    - Identify key assumptions and approximations relevant to the results used in the decision-making process.

The purpose of the remaining portion of this report is to address the requirements identified in Item 4 above.

3. BFN PRA TECHNICAL ADEQUACY

The Tennessee Valley Authority (TVA) maintains an Internal Events (IE) PRA Model including Internal Flooding (IF), a Fire PRA (FPRA), and a Seismic PRA (SPRA) Model for the Browns Ferry Nuclear (BFN) Power Plant. These PRA models have been developed in accordance with the requirements of RG 1.200 Rev. 2, subjected to Peer Review and the Appendix X Facts & Observations (F&O) Closure process. These models are highly detailed, and include a wide variety of modeled systems, operator actions, and common cause events.

The TVA PRA organization uses a multi-faceted, structured approach in establishing and maintaining the technical adequacy and fidelity of the PRA models across the nuclear fleet. This approach includes a proceduralized PRA maintenance and update process, as well as independent peer reviews. The IE with IF PRA quantification process is based on a single top fault tree analysis which is a well-known and accepted methodology in the commercial nuclear power plant industry. The IE with IF model is maintained and quantified using the Electric Power Research Institute (EPRI) Risk & Reliability suite of software programs. The FPRA and SPRA models are quantified using the widely accepted EPRI FRANX methodology.

3.1 PRA Model Fidelity, Realism and Configuration Control

BFN PRA model fidelity, realism and configuration control is governed by a TVA Fleet procedure which:

- defines PRA model configuration control requirements (e.g., changes to the plant design, operational procedures[1], technical specifications, maintenance and testing, etc.)
- defines data collection sources and requirements
- defines roles and responsibilities of interfacing organizations (e.g., system engineering, operations, maintenance rule, etc.)

3.2 PRA Maintenance and Update

The PRA maintenance and update process is governed by fleet procedures that are applicable to all TVA nuclear units. The TVA risk management process ensures that the applicable PRA models represent the as-built, as-operated plants. Initial models and model upgrades are required to be subjected to independent peer review against the requirements of the ASME/ANS PRA Standard as endorsed by RG 1.200.

The following information describes this approach as it applies to the Browns Ferry PRA.

- NEDP-26, "Probabilistic Risk Assessment"
  - defines the process and management of PRA applications, periodic updates, and model maintenance and review,
  - for risk-informed applications, such as TSTF-425, the procedure requires the PRA staff to revise the appropriate risk related calculations following model updates,

[1] Operating procedures include normal operations, emergency operations, off-normal operations, severe accident mitigation guidelines, and others.

- defines PRA Maintenance and PRA Upgrade,
- updates are required on a routine frequency or by the cumulative impact of plant configuration changes that exceed a threshold value,
- the decision to update the PRA model ahead of a normal scheduled PRA maintenance cycle should be made commensurate with the overall impact to the model, taking into consideration the impact on risk-informed applications and programs that use the results from model quantification, for example, Mitigating System Performance Index (MSPI), On-Line Risk Management, Surveillance Frequency Control Program (SFCP), and others,
- defines information sources to review for model updates,
- defines the 'living model' evaluation of plant changes for the cumulative effect on the PRA results,
- PRA model updates are required to be re-quantified using truncation limits that ensure preservation of model fidelity and to demonstrate convergence for both CDF and LERF.

There are two types of updates to the PRA models,

1. PRA Maintenance - the update of PRA models to reflect plant changes such as plant modifications, changes to operating procedures, or plant performance data. PRA maintenance focuses on ensuring the model accurately reflects the current plant configuration and performance. This includes identification, review, and evaluation of new plant information and the documentation for that information. This is performed at a minimum of every five years.

2. PRA Upgrade - the incorporation into a PRA model of a new methodology or changes in scope of capability that significantly impacts the results of the significant accident progression sequences.

3.3 PRA Model History

The current BFN MOR Rev. 9 represents the current as-built, as-operated plant and associated risk profile for internal events (with internal flooding). The Fire PRA MOR is Rev. 6, and the seismic MOR is Rev. 1. The BFN PRA modeling is highly detailed, including a wide variety of initiating events, modeled systems, operator actions, common cause events, and inter-unit impacts. The PRA model quantification process is based on event tree/fault tree linking which is a well-known methodology employed throughout the industry. In addition, the BFN PRA models (internal events with flooding, fire and seismic) have been subjected to several full-scope and focused-scope peer reviews since 2009, as summarized in Table 1. These reviews were performed in accordance with RG 1.200 Rev. 2 and the endorsed ASME/ANS PRA Standard, ASME/ANS RA-Sa-2009, with exception of the SPRA that was subject to the PRA Standard Code Case.

Each peer review built upon the previous peer review to continuously improve the technical adequacy of the BFN PRA models. These peer reviews are further discussed in sections 3.4, 3.5 and 3.6, with information regarding supporting requirements status and F&O (findings) status.

Table 1 BFN PRA Peer Reviews

Date	Type of Review	Guidance	Model of Record
AUG 2009	Internal Events (Full Scope)	RG 1.200 R2 NEI 05-04 R3	FPIE Draft Rev. 0
OCT 2009	Internal Flooding (Focused Scope)	RG 1.200 R2 NEI 05-04 R3	FPIE Draft Rev. 0
MAY 2012	Fire (Full Scope)	RG 1.200 R2 NEI 07-12 R1	FPRA Draft Rev. 0
OCT 2012	Fire (Focused Scope)	RG 1.200 R2 NEI 07-12 R1	FPRA Rev. 4
JUN 2015	Fire (Focused Scope)	RG 1.200 R2 NEI 07-12 R1	FPRA Rev. 5
AUG 2015	Internal Events 2009 F&O Resolution Review (Focused Scope)	RG 1.200 R2 NEI 05-04 R3	FPIE Rev. 6
OCT 2018	Internal Flooding Focused Scope Peer Review	RG 1.200 R2 NEI 05-04 R3	FPIE Rev. 8
NOV 2018	Internal Events 2009 F&O Resolution Review	RG 1.200 R2 NEI 05-04 R3	FPIE Rev. 8
MAY 2019	Seismic (Full Scope)	NEI 12-13 ASME/ANS RA-Sb-2013, Code Case 1	SPRA Rev. 0
NOV 2019	Seismic PRA Independent Assessment (F&O Closure)	NEI 12-13 Appendix X	SPRA Rev. 0

3.3.1 Internal Events PRA with Internal Flooding PRA

Table 2 presents a summary of base CDF and LERF values obtained for each model revision.

Table 2 Internal Events with Internal Flooding Model CDF and LERF

		U1		U2		U3	
Model	Date	CDF/yr	LERF/yr	CDF/yr	LERF/yr	CDF/yr	LERF/yr
Rev. 0	MAR 2010	7.18E-06	2.60E-06	7.89E-06	3.16E-06	1.13E-05	1.75E-06
Rev. 1	AUG 2010	5.08E-06	9.81E-07	5.40E-06	9.70E-07	6.36E-06	8.44E-07
Rev. 2	SEP 2010	4.90E-06	8.76E-07	4.93E-06	8.67E-07	4.56E-06	7.49E-07
Rev. 3	JUN 2011	4.66E-06	1.27E-06	4.32E-06	1.70E-06	5.95E-06	6.26E-07
Rev. 4	DEC 2011	4.65E-06	1.23E-06	4.29E-06	1.65E-06	5.80E-06	6.21E-07
Rev. 5	NOV 2012	5.64E-06	9.50E-07	4.97E-06	9.19E-07	5.96E-06	9.66E-07
Rev. 6	JAN 2015	6.05E-06	1.11E-06	5.25E-06	1.06E-06	5.88E-06	1.05E-06
Rev. 7	MAR 2016	6.93E-06	1.26E-06	6.29E-06	1.21E-06	7.72E-06	1.45E-06
Rev. 8	FEB 2018	1.08E-05	1.44E-06	6.98E-06	1.28E-06	1.02E-05	1.34E-06
Rev. 9	NOV 2019	4.07E-06	8.64E-07	3.28E-06	7.95E-07	5.99E-06	7.98E-07

3.3.2 Internal Events PRA With Internal Flooding - Model Updates

Table 3 presents a summary of internal events with internal flooding model change history.

Table 3 Internal Events With Internal Flooding PRA Model Update Changes

	% Change in CDF			% Change in LERF			Comments
Model	U1	U2	U3	U1	U2	U3	
Rev. 0	N/A	N/A	N/A	N/A	N/A	N/A	Initial CAFTA model issued after August 2009 peer review.
Rev. 1	-29.2%	-31.6%	-43.7%	-62.3%	-69.3%	-51.8%	Initiating events updated to include current generic data, recent plant events and multi-unit initiators. Fire initiators that fail offsite power were added to the model to assess the Diesel Generator Allowed Outage Time Extension. Some logic errors and type code errors were also corrected that were identified from the Revision 0 to Revision 1 model.
Rev. 2	-3.5%	-8.7%	-28.3%	-10.7%	-10.6%	-11.3%	Initiators %VR and %VS were added for all units. The human error probability for failure to align additional CST inventory was re-evaluated based on an additional MAAP run performed. A design change was incorporated into the model that requires three air compressors to supply the entire plant instead of all four. Some logic errors were also corrected that were identified from the Revision 1 to Revision 2 model.
Rev. 3	-4.9%	-12.4%	30.5%	45%	96.1%	-16.4%	The Fire initiators used to assess the Diesel Generator Allowed Outage Time Extension were removed from Revision 3 of the model. Some logic errors and type code errors were also corrected that were identified from the Revision 2 to Revision 3 model.
Rev. 4	-0.2%	-0.7%	-2.5%	-3.1%	-2.9%	-0.8%	Changes were made from the Revision 3 to Revision 4 model to support increased unavailability for infrequent maintenance performed on the Emergency Diesel Generators and corrections to logic errors and type code errors found.

	% Change in CDF			% Change in LERF			Comments
Model	**U1**	**U2**	**U3**	**U1**	**U2**	**U3**	
Rev. 5	21.3%	-15.9%	2.8%	-22.8%	-44.3%	55.6%	The major change in this update was to revise the data, and mutually exclusive logic. Changes were made in the Revision 5 model to correct errors in the logic noted during review following the issuing of the Revision 4 documentation and to support increased unavailability for infrequent maintenance being performed on the Emergency Diesel Generators. The data in the PRA model was updated for plant specific failures and successes through January 1, 2012. There were no changes in the Accident Analysis, Success Criteria, Internal Flooding, or LERF Analysis, from Revision 4 to Revision 5. • The initiating event analysis was updated to include initiating event data through January 1, 2012 to include current industry generic data, recent plant events and multi-unit initiators. • Changes were made in the Revision 5 model to correct errors in the logic noted during review following the issuing of the Revision 4 documentation. • The unreliability, unavailability, and common cause data analyses were updated. The unreliability (or failure rate) data are based on generic industry data that underwent Bayesian updating with plant specific data. Plant specific data for the period 1/1/2003 to 1/1/2012 was evaluated and used as input to the Bayesian analysis. Plant maintenance unavailability data was based on the same time period as the failure data, 1/1/2003 to 1/1/2012. Generic industry data from NUREG/CR-6928 was used for components for which no plant specific data was available.

	% Change in CDF			% Change in LERF			Comments
Model	**U1**	**U2**	**U3**	**U1**	**U2**	**U3**	
Rev. 6	7.3%	5.6%	-1.3%	16.8%	15.3%	8.7%	A model update was performed to merge the Internal Events PRA and the Fire PRA into a single model, to improve the event tree logic, and to resolve issues for AC and DC power. A brief overview of these changes is included in the bullets shown below: • Event Tree changes to credit RCIC for scenarios with an inadvertent open relief valve • Event Tree changes to separate the decay heat removal functional top logic in a more logical manner (hardened wetwell vent and drywell vent, Drywell Sprays) • Event Tree changes to incorporate Alternate Shutdown Cooling for the Fire PRA • Event Tree changes to incorporate the High Pressure Makeup for the Fire PRA • Logic fault tree changes to address net positive suction head without CAP • Correct the logic for DC chargers • Logic fault tree changes to address overload and load shed logic • Logic changes to address preferred pump logic • Logic changes to address diesel paralleling logic • Logic changes to address conditional LOOP logic • Limited enhancement for LOOP recovery • Develop recoveries for Main Steam Line Break Outside Containment instrumentation • Updated Raw Cooling Water logic
Rev. 7	14.5%	19.8%	31.3%	14.3%	14.2%	38.1%	The initiating event analysis was updated in Revision 7 of the model to include initiating event data through September 1, 2015 to include current industry generic data, recent plant events and multi-unit initiators. The event trees were updated to account for inclusion of the Fire PRA model into the Internal Events PRA model. The Large LOCA event tree was revised to remove the core flood mitigation system as it does not prevent core damage Multiple model changes to match the as-built configuration, correct errors and enhance the model.

	% Change in CDF			% Change in LERF			Comments
Model	U1	U2	U3	U1	U2	U3	
Rev. 8	55.8%	11.0%	32.1%	14.3%	5.8%	-7.6%	Changes were made to the Revision 7 model to update the human reliability analysis, internal flood analysis, to implement enhancements, or to correct errors in the logic noted during review following the issuing of the Revision 7 documentation. In addition, plant design changes implemented following the Revision 7 model were reviewed to determine whether additional changes to the model were necessary. Multiple model changes to match the as-built configuration, correct errors and enhance the model.
Rev. 9	-62.3%	-53%	-41.3%	-40%	-37.9%	-40.4%	The Rev. 9 MOR documentation was updated to explain modeling asymmetries.

3.3.3 Fire PRA

The FPRA model was integrated with the Internal Events with Flooding model since Revision 6. Table 4 presents fire CDF and LERF values obtained for each model revision.

Table 4 Fire PRA Model CDF and LERF

		U1		U2		U3	
Summary Report Revision[1]	Date	CDF/yr	LERF/yr	CDF/yr	LERF/yr	CDF/yr	LERF/yr
Rev. 0	FEB 2013	6.28E-05	2.14E-06	6.59E-05	1.90E-06	5.30E-05	1.83E-06
Rev. 1	MAR 2013	6.28E-05	2.14E-06	6.59E-05	1.90E-06	5.30E-05	1.83E-06
Rev. 2	NOV 2013	6.28E-05	2.14E-06	6.59E-05	1.90E-06	5.30E-05	1.83E-06
Rev. 3	DEC 2014	5.03E-05	5.47E-06	5.64E-05	5.37E-06	5.92E-05	5.02E-06
Rev. 4	APR 2015	5.03E-05	5.47E-06	5.64E-05	5.37E-06	5.92E-05	5.02E-06
Rev. 5	DEC 2017	6.03E-05	6.80E-06	6.47E-05	7.37E-06	6.49E-05	5.96E-06
Rev. 6	NOV 2019	3.48E-05	5.44E-06	4.25E-05	5.50E-06	3.28E-05	4.52E-06

Note: The Quantification Notebook revision was used in this table as opposed to the model revision. All of the document numbers correspond to the BFN Fire PRA post-transition model.

3.3.4 Fire PRA – Model Updates

Table 5 presents a summary of FPRA model change history.

Table 5 Fire PRA Model Update Changes

	% Change in CDF			% Change in LERF			Comments
Summary Report Revision	U1	U2	U3	U1	U2	U3	
Rev. 0	N/A	N/A	N/A	N/A	N/A	N/A	Initial post-transition CAFTA model.
Rev. 1	0%	0%	0%	0%	0%	0%	Editorial changes to documentation, including some F&O dispositions.
Rev. 2	0%	0%	0%	0%	0%	0%	Editorial changes to documentation, including some F&O dispositions.
Rev. 3	-19.9%	-14.4%	11.7%	155.6%	182.6%	174.3%	Circuit failure mode likelihood analysis now uses probability values based on test data documented in NUREG/CR-7150. This impacts Section 6.1.10 and the disposition of F&Os 2-46, 2-47, and 4-15. Updated various F&O dispositions.
Rev. 4	0%	0%	0%	0%	0%	0%	Revision of Attachment A and B and other editorial changes.
Rev. 5	19.9%	14.7%	9.6%	24.3%	37.2%	18.7%	Changes in this are limited to minor revisions in Section 6.1.16, a complete revision of the quantification results tables in Section 7.0, an update of Attachment A to incorporate results of 2015 Focused-Scope Peer Review, and minor editorial changes throughout the body of the calculation. The references to BFN documents are updated to the current revisions as applicable. Attachment 1 was deleted because it is no longer relevant for this revision of the notebook.
Rev. 6	-42.3%	-34.3%	-49.5%	-20%	-25.4%	-24.2%	This revision was a scheduled update that incorporated quantification results from model changes to include those made to the ignition frequencies, fire modeling, cable selection, circuit failure probabilities, and plant response model analyses in response to demands such as condition reports plant modifications, and internal events model updates.

3.3.5 Seismic PRA

Table 6 presents seismic CDF and LERF values obtained for each model revision.

Table 6 Seismic PRA Model CDF and LERF

		U1		U2		U3	
Model Revision	**Date**	**CDF/yr**	**LERF/yr**	**CDF/yr**	**LERF/yr**	**CDF/yr**	**LERF/yr**
Rev. 0	APR 2019	5.07E-06	3.53E-06	5.77E-06	3.56E-06	6.50E-06	4.84E-06
Rev. 1	NOV 2019	6.30E-06	3.00E-06	6.40E-06	3.10E-06	7.13E-06	3.31E-06

3.3.6 Seismic PRA - Model Updates

Table 7 presents a summary of SPRA model change history.

Table 7 Seismic PRA Model Update Changes

	% Change in CDF			% Change in LERF			Comments
Model Revision	**U1**	**U2**	**U3**	**U1**	**U2**	**U3**	
Rev. 0	N/A	N/A	N/A	N/A	N/A	N/A	Initial issue of SPRA model
Rev. 1	24.3%	10.9%	9.7%	-15.0%	-12.9%	-31.6%	Revision 1 was issued to reflect the F&O Closure review.

3.4 Internal Events (With Internal Flooding) PRA Model and Peer Review

3.4.1 Internal Events With Internal Flooding PRA Peer Review Assessment

The BFN Internal Events (excluding Internal Flooding) PRA was subjected to a full scope peer review in May 2009, in accordance with the requirements of NEI 05-04. The review covered all technical elements in Part 2 plus the configuration control element from the ASME/ANS PRA Standard RA-Sa-2009 that was endorsed by RG 1.200, Rev. 2. Table 8 presents the results of this peer review.

Table 8 Internal Events PRA Model 2009 Peer Review SR Capability Category Distribution

Capability Category	Number	Percent
Not Met	53	20
I	10	4
I/II	10	4
II	26	10
II/III	20	8
III	3	1
Met (All)	140	53
Not Applicable	2	1
TOTAL	**264**	**100%**

Internal Flooding was not included in the scope of this review. Of these 264 ASME PRA Standard Supporting Requirements (SRs) reviewed, approximately 76% are

supportive of Capability Category II or greater. There were a total of 189 unique F&Os generated by the peer review team, from which 95 were Findings, 92 were Suggestions and 2 were Best Practices.

A separate Internal Flooding focused-scope review was performed on the BFN PRA in September 2009. The review covered all technical elements from the ASME/ANS PRA Standard Part RA-Sa-2009. Table 9 presents the results of this focused-scope peer review.

Table 9 Internal Flooding PRA Model 2009 Focused-Scope Peer Review SR Capability Category Distribution

Capability Category	Number	Percent
Not Met	26	42
I	3	5
II or better	30	48
Not Applicable	2	3
Not Reviewed	1	2
TOTAL	**62**	**100%**

The BFN internal flood PRA met CC-II or higher for about 48% of the applicable SRs. The BFN internal flood PRA met CC-I level for an additional 5% of the applicable SRs. There were a total of 50 F&Os generated during this focused-scope peer review, including 29 Findings and 21 suggestions.

The key problem areas for the IF PRA were documentation and flood scenario development. All 15 documentation SRs were rated as not meeting the standard requirements. The primary problem associated with documentation was lack of details, numerous inconsistencies, and incomplete information in the input data, process, and results. The IF PRA was not prepared in a manner that can facilitate PRA applications, upgrades and peer review. To be consistent with the applicable SRs, more effort was needed to enhance the documentation. The major problem associated with the flood scenario development that was the development of flood scenarios was not rigorously performed. Many flood areas, flood sources and flood scenarios were dismissed without adequate considerations of all the possible flooding effects that may cause damage to structures, systems or components credited in the PRA. As a result, the total number of flood scenarios that were quantitatively evaluated was far less than expected and the results from some top internal flood-induced risk contributors were not completely realistic.

The internal flooding model was thus updated and an additional Internal Flooding model Focused Scope Peer Review (FSPR) was completed in September 2018, again covering all technical elements from the ASME/ANS PRA Standard Part RA-Sa-2009 Part 3. This IF FSPR was conducted concurrently with an Internal Events F&O closure review activity, which is discussed in Section 3.4.2. The IF FSPR and associated conclusions supersedes the IF PRA Peer Review and associated findings from 2009. As a result of this FSPR, all existing F&Os were considered to be not applicable anymore and 11 new F&Os were generated. A total of 7 Findings, 3 Suggestions and 1 Best Practice were reported by the peer review team. The results of this assessment is reported in Table 10.

Table 10 Internal Flooding PRA Model 2018 Focused-Scope Peer Review SR Capability Category Distribution

Capability Category	Number	Percent
Not Met or CC I	7	11
II or better	55	89
Not Applicable	0	0
Not Reviewed	0	0
TOTAL	**62**	**100%**

The peer review team concluded that, from a technical perspective, the IF analyses appeared to address the appropriate inputs and outputs, and the modeling approaches appeared sound. In addition, the team concluded that the changes made appeared to meet most of the requirements in the standard at or above Capability Category II, with the caveats provided with the F&Os.

3.4.2 Internal Events With Internal Flooding PRA F&O Closure Review

The 95 Internals Events Finding F&Os identified in the peer review in May 2009 were subjected to an F&O Resolution FSPR in 2015, which followed the guidance from NEI 05-04. The review was conducted over a 3-day period by a team of four independent PRA experts, and included a consensus process to determine the adequacy of the resolution to each reviewed Finding. Following that review, there were 48 Findings that remained open, including nine that were not assessed due to time constraints.

A subsequent F&O Closeout Assessment was completed in September 2018 at the TVA Chattanooga offices for the 48 Internals Events Findings that remained open. This assessment was completed in accordance with the process documented in Appendix X to NEI 05-04/07-12/12-13, as well as the requirements published in the ASME/ANS PRA Standard (RA-Sa-2009) and RG 1.200 Revision 2 including NRC expectations. A team of three independent PRA experts performed the F&O reviews along with the consensus sessions. The review met the Appendix X requirement that each F&O review include two qualified reviewers. Furthermore, the team examined the changes made to the BFN PRA model, data, and documentation to address the findings to determine if the Capability Category II (or better) requirements of the ANS/ASME PRA Standard, including clarifications imposed by RG 1.200, Revision 2 were met.

The Closure Peer Review Team had significant PRA experience, and each team member confirmed they were not TVA employees, had no involvement in development of the BFN PRA or performance of risk applications for BFN, and no conflicts of interests, incentives or disincentives.

The closure review team concluded that all but 10 of the 48 F&Os reviewed met the criteria for closure. In addition, an assessment was performed to determine if the F&O resolution resulted in an upgrade to the PRA or used new PRA methods. The peer review team concluded that those F&Os that were closed did not fall in the upgrade category and did not use new PRA methods (those F&Os remaining open were not

assessed). Table 11 presents the ten Internal Events Finding F&Os that remain open, and their impact on the application is described.

Finally, the seven Finding F&Os identified in the 2018 focused scope Internal Flood peer review remain open, as no formal closure review has been performed to date. These Internal Flooding Finding F&Os that remain open are also listed in Table 11, and their impact on the application is described.

Table 11 Open Internal Events With Internal Flooding PRA Open F&Os

F&O 1-17	Reviewed DA.01. The source of demands is not discussed. Based upon discussions with the PRA staff, exposure is collected directly from plant data systems and is therefore actual component exposure. However, post-maintenance testing demands are also included in these numbers and are not removed.
Associated (SRs)	**BASIS FOR SIGNIFICANCE**
DA-C6	Post-maintenance testing must be excluded from the exposure data per the SR. **POSSIBLE RESOLUTION** Develop a means of identifying the post-maintenance related exposure and remove them from the data calculations. **PLANT RESPONSE** As mentioned in the DA Notebook, the only demands that are included in the data analysis update of failure rates are those that come directly from PEDs, from the IST database or from the system engineer directly. The IST database gives just those successful demands that occur for each test (i.e. no post maintenance demands included). PEDs/ the system engineer gives the actual number of demands the component observes which could potentially include post maintenance demands, however a sensitivity was performed (BFN-0-15-079) which shows that the model is not sensitive PMTs.
Closure Review	**STATUS** Open **BASIS** BFN uses an automatic demand counter to populate the data. As such this would include all related surveillance, maintenance and operational demands. Because the system may count additional demands for PMTs BFN has estimated these additional demands and performed sensitivities to support the impact on the failure rates. Although the sensitivities may justify a minimal impact, it does not meet the SR (DA-C6). DA-C6 remains Not Met.
Impact on SFCP	Based on the sensitivities performed, this open F&O has minimal impact on failure rates. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations for affected components.

F&O 1-33	There is no discussion of the review of the LERF contributors (ASME/ANS RA-Sa2009 Table 2-2.8-9) for reasonableness per the review of the QU Notebook and LE.01.
Associated (SRs)	**BASIS FOR SIGNIFICANCE**
LE-F2	A review of the reasonableness of the results of the analysis of the contributors to LERF is required per the SR. **POSSIBLE RESOLUTION** Perform and document a review of the reasonableness of the contributors to LERF. **PLANT RESPONSE** The review of the CDF and LERF cutsets was performed and documented in Attachment D and E of the Quantification Notebook. Section 6.3.2.3 of the Quantification notebook specifies the types of things that were looked at when reviewing the cutsets. The Top 100 cutsets, a sample of 100 cutsets from the middle and the last 100 cutsets were all reviewed and showed no signs of inconsistencies in logic.
Closure Review	**STATUS** Open **BASIS** The current documentation provides a listing of addressed phenomena and failures postulated to lead to LERF in Table A.1-2. How the BFN model maps to these postulated events is provided in Table 11. The model mapping is again provided in the QU notebook in Table 6.3–11. The frequency results are tabular in the QU notebook and there is a comparison of absolute frequency to similar designs. However, there is no documented review of the results to determine if the LERF results are reasonable and that the identified contributors (categories) are consistent with expectations. A pointer to the summary document was provided but the requested information was not found at that location. SR LE-F2 was previously Not Met and remains Not Met.
Impact on SFCP	This is a documentation issue. Reasonableness check of results ensures the actual results obtained align with expected results. Therefore, no impact is expected on the STI change evaluations performed in accordance with the SFCP.

F&O 2-31	For SPC and LPCI, the LPCI injection valves and SPC return valves are required to reposition when swapping RHR modes, but this is not included in the model. The RHR system notebook indicates that these valves need to close for the opposite function. However in one location in the notebook it is indicated that flow can be split between LPCI and SPC.
Associated (SRs) **SY-A5** **SY-A13**	**BASIS FOR SIGNIFICANCE** All active components should be included in the failure modes of a system. **POSSIBLE RESOLUTION** Add failure mode to the fault trees and clarify documentation **PLANT RESPONSE** The injection valves do need to change position for split LPCI/SPC flow; two valves would have to fail to modulate or close in either path to fail either system. An operator interview was conducted to address this issue. The common cause failure probability of two MOV's to close is less than 1E-5. The RHR pump start failure probability is approximately 1.4E-3. The failure of two MOV's to close is less than 2 orders of magnitude lower than another failure that would fail the system in a similar manner. Therefore, failure to close (or modulate) either the LPCI or SPC injection path can be neglected. The RHR system notebook was modified to reflect this and the operator interview was added.
Closure Review	**STATUS** Open **BASIS** The model includes other valve realignments and common cause. It is unclear why this specific change would warrant a unique modeling approach. The absence of this failure mode could alter the importance calculations for the identified components and impact the ability to determine MSPI characteristics. It would be expected that these valves would need to be included since it does involve a physical change in state. SY-A5 remains Met. SY-A13 remains Met.
Impact on SFCP	A very small change in to suppression pool cooling (SPC)/Low Pressure Coolant Injection (LPCI) component and/or system importance is expected. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations related to the LPCI injection valves or SPC return valves.

F&O 3-12	There is no evidence of an analysis for sequences that go beyond the 24-hour period to evaluate the appropriate treatment relative to the CC II/III requirements for SC-A5.
Associated (SRs) **SC-A5**	**BASIS FOR SIGNIFICANCE** A CC II/III for SC-A5 requires that options other than assuming sequences in which a stable state has not been reached in 24 hours goes to core damage. **POSSIBLE RESOLUTION** Perform and document an analysis of sequences that do not achieve a stable state in 24 hours to determine which of the options presented in the SR would be a most appropriate disposition for that sequence. Then change the PRA model accordingly. **PLANT RESPONSE** Basis for "Safe and Stable" for HFA_0085ALIGNCST - During a single unit accident, refill of the CST inventory is credited in the model (HFA_0085ALIGNCST) by refilling from the nonaccident unit's CST. During a multi-unit accident, it is assumed that the TSC would direct the operators to provide additional inventory to the CSTs from an outside source given the CST depletion would not occur for 10 hours. This assumption is not documented in the current model. • It is already considered in the cognitive analysis for HFA_0085ALIGNCST and the assumption that the TSC would direct operators to provide additional inventory to the CSTs is documented in the HRA Notebook. The alarm response procedures 1(2,3)ARP-9-6B provides a list of alternative sources including: 1) Hotwell or Radwaste transfer to CST, 2) Demin or another CST transfer to the affected CST, and 3) CST Crosstie. The TSC and OSC would determine and perform the appropriate actions based on conditions at the plant and the choices identified in ARP.
Closure Review	**STATUS** Open **BASIS** Additional discussion of the bases for "safe and stable" has been added. However there is no discussion whether any sequences were identified that require a mission time beyond 24 hours to reach safe and stable. Note that Table 6-1 of SC.1 contains several statements implies that sequences may not safe be and stable at 24 hours and a bounding PDS may be assigned. This instruction in Table 6-1 is consistent with SC-A5 Cat I. SC-A5 remains met at Cat I.
Impact on SFCP	This is a documentation issue, with a possible impact on the mission time for a few sequences, for which bounding plant damage states (PDS) have been assigned. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations, for surveillances related to containment isolation or that may affect containment boundaries.

F&O 4-18	Some operator actions assume that the execution failure probability (Pe) is 0.0 including: HFA_0_ADSINHIBIT, HFA_0_ATWSLEVEL, HFA_0024RCWINTAKE, HFA_0027INTAKE, HFA_0IR2_LPI, HFA_1063SLCINJECT, HFA_0024IFISOL Example 1: Several operator actions for ATWS scenarios (e.g., HFA_1063SLCINJECT: Failure to SLC in response to an ATWS event) assume the execution failure probability (Pe) is 0.0. Example 2: Operator action HFA_0024RCWINTAKE (Failure to clear debris at intake before reactor scram) assumes an execution error of 0.0 based on the following: 'Cleaning traveling screens does not relate to a series of manual actions, but to an effort among several operators. It is assumed that, if the action is initiated within 1 hr., it will be successful.' The same rationale is provided for no execution error in HFA_0027INTAKE.
Associated (SRs) **HR-G2**	**BASIS FOR SIGNIFICANCE** Execution failure is a required part of the HEP calculation, and the argument for ignoring execution failure is not necessarily compelling, especially for maintaining level (HFA_0_ATWSLEVEL). Some of the actions for which Pe is not considered are important to the overall results. **POSSIBLE RESOLUTION** Include Pe in the quantification of HFA_1063SLCINJECT, HFA_0_ADSINHIBIT, HFA_0_ATWSLEVEL, HFA_0024RCWINTAKE and HFA_0027INTAKE. Insure that execution errors are considered appropriately in other HEPs, as well. **PLANT RESPONSE** • Execution error has not been included for ADS inhibit (HFA_0_ADSINHIBIT). This is modeled only for ATWS in the PRA. There is a single step to implement this action, errors of omission are integral to the cognitive error to omit the action. Errors of commission are neglected because the action to inhibit ADS is unique (no transition to any EOI Appendix is required, and there are several places in the EOI that call for inhibiting ADS), and because it is routinely performed for every reactor scram, graphically distinct and performed after SLC. • Execution error was added for SLC. This is a time critical operator action, and the EOI specifies the appropriate steps required in EOI-Appendix 3A. While the actions are simple, these require transition between procedures for the execution, so it is appropriate to include execution errors. • HFA_0_ATWSLEVEL -Execution errors are included for this event. NO CHANGE.

	• HFA_0024RCWINTAKE - Execution error set to zero and it deemed not necessary to add detail for this activity. Clearing traveling screens does not relate to a series of manual actions, but to an effort among several operators, so errors of execution are in parallel and considered unlikely. It is assumed that, if the action is initiated within 1 hour, it will be successful (i.e. only the cognitive error is included). The RCW system is supplied river water from the CCW conduits of each unit through fine mesh strainers that include a dP alarm. Pumps are run periodically to avoid fouling. • HFA_0027INTAKE - Basic event is not in the model. NO CHANGE • HFA_0IR2_LPI -Execution errors are included for this event. NO CHANGE. • HFA_0024IFISOL - This event is not used in the PRA model. NO CHANGE.
Closure Review	**STATUS** Partially Closed **BASIS** Execution failure probability has been added to some HFEs but not others. HFA_0024RCWINTAKE involves physically cleaning the intake screens within time to prevent a plant trip or equipment overheating. Assuming the execution failure probability is zero is inappropriate. HR-G2 remains Met.
Impact on SFCP	STI changes are not affected by human error probabilities (HEPs) as the calculation determines the change in risk due to changes in reliability. Additionally, minimal or no impact on the PRA results is expected.

F&O 4-25	There are many operator actions that use screening values; see Table 8 of the HRA. None of these actions appear to use any information to base the time available and the times to operator cues and perform the actions are not documented.
Associated (SRs) **HR-F2** **HR-G4** **HR-G5**	**BASIS FOR SIGNIFICANCE** Without any real timing information, it is not possible to estimate, even at a screening level, the probability of operator failure or success. **POSSIBLE RESOLUTION** Provide timing information for all operator actions, including those HEPs estimated by using screening values. **PLANT RESPONSE** Clarification on the basis for the timing has been added to the HRA notebook.
Closure Review	**STATUS** Open

	BASIS BFN-0-16-031 list several HFEs with clarification of the timing information. These are not the HFEs listed in Table 8 as referenced in the F&O, nor is there any discussion why these events were selected. NDN-000-999-2007-0032 Assumption 10 assumes that screened HFEs all have a delay time of 24h. This is not consistent with several of the event descriptions, which imply the timing would need to be less than 24h for success (some screened events list times of 15m or less in the description). HR-F2 remains Not Met (F&O 4-25) HR-G4 remains Not Met (F&O 4-25) HR-G5 remains Not Met (F&O 4-25)
Impact on SFCP	STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability. Additionally, this is a documentation issue with no impact on the PRA results.

F&O 4-42	Table 3 of the data notebook says that EDG boundaries included the output breakers, but the EDG system notebook and the model have them as separate events. NUREG/CR-6928 lists breakers as WITHIN the boundary of the EDG.
Associated (SRs) **SY-A8**	**BASIS FOR SIGNIFICANCE** Apparent inconsistency in data and component boundary definitions. **POSSIBLE RESOLUTION** Resolve discrepancy. **PLANT RESPONSE** The EDG output breakers 1818, 1822, 1812, 1816, 1838, 1842, 1832, and 1836 have been included within the boundary of the EDG. The output breakers are no longer explicitly modeled. The EDG system notebook and table 4 have been updated to reflect this change.
Closure Review	**STATUS** Open **BASIS** The system notebook did indicate that the failure of output circuit breakers was included within the EDG boundary. However, the CAFTA model still had separate events for breaker failure with probability included (CBKFC0BKR_211A_022). SY-A8 remains Met.

Impact on SFCP	Minimal impact expected on PRA results. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations affecting the EDG output breakers.

F&O 6-10	CCF for Battery Chargers is not included in the Initiating Event Fault Tree for loss of 2 DC buses, other than for the standby chargers (not in the yearly failure rate logic).
Associated (SRs) **IE-C8**	**BASIS FOR SIGNIFICANCE** Can affect the loss of DC initiating events by a factor of 10, depending on how CCF is calculated. **POSSIBLE RESOLUTION** Include CCF under the yearly failure rate logic or as a top event for all loss of DC initiating events. **PLANT RESPONSE** The IE Notebook lists an Assumption about why inclusion of common cause is not included for support system initiators. Inclusion of common cause into the support system initiator development would produce overly conservative initiator frequencies as mentioned in the previous response. In order to obtain a more realistic model TVA decided to leave out the common cause events for initiator development. Inclusion of the common cause for support system initiator development will be reevaluated and incorporated as required following completion of the evaluation.
Closure Review	**STATUS** Open **BASIS** An assumption in IE.01 states that inclusion of common cause failures in the initiating event tree would yield inappropriate/conservatively high frequencies. This is counter to current guidance in EPRI TR1016741. An update to IE.01 should be prepared following the EPRI process which allows for appropriate screening of events and other adjustments. IE-C8 remains Not Met (see F&O 6-10).
Impact on SFCP	Minimal impact expected on PRA results. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations affecting the battery chargers.

F&O 6-30	Dependencies between operator actions appear to be non-conservatively applied. Mainly, the Zero Dependence (ZD) between actions is commonly applied, simply when one of the actions takes longer than 60 minutes. What appears to be the mistake is applying the last event tree node in the Dependency Event Tree. In this tree, if the stress of either HFE is moderate or high, the upper leg of the event tree is used. So for combo 2, the HRA assumes ZD, while the event tree would designate Low Dependency.
Associated (SRs) **QU-C2** **HR-G7**	**BASIS FOR SIGNIFICANCE** Systematic error affecting around 1/2 of the combo events, including combo 18. **POSSIBLE RESOLUTION** Correct dependency analysis in the HRA. **PLANT RESPONSE** • The basis for ZD between early depressurization HFA_0001HPRVD1, and failure to align suppression pool cooling is significant differences, cues and timing. Early depressurization is associated with failure to maintain RPV level, while failure to align SPC (nonATWS/IORV) is associated with SP temperature. MAAP analysis demonstrates that operators have 3 hours to start suppression pool cooling to avoid exceeding 190F and thus eventually impacting HPI systems taking suction from the SP. Since HPCI and RCIC take suction from the CST initially, it would take several hours to deplete the CST prior to any swapping suction to the SP. Early SPC failure was included in the model under late failure for HPI since early failure would result in high SP temperature that may preclude late swap over of suctions for HPI. • The basis for the User Defined dependency levels has been added to the HRA calculation in Appendix E.
Closure Review	**STATUS** Open **BASIS** The stated resolution addresses only addresses some specific HFEs, however during discussion it was identified that the dependency analyses were completely redone. The actual process used to identify and process dependencies in general is not described, only that the "EPRI recommended" method is used. More detail is needed. HRA NB Section 6.3.3 points to the Quantification and Quantification NB points back to HRA NB. The use of automated tools is mentioned but the actual tools and how they are used is not discussed. There is and assumption (in HRA and Quant) that HFEs with screening HEPs of 0.1 or greater are treated as independent. Discussions with the analyst indicated this is not how they are treated. In the Quantification NB it states that the base quantification use a seed value of 0.15 for all HEPs. In section 6.3.1.9 its states that a sensitivity is performed using 1.0 as the seed value and references the HRA calc. It is not clear how the dependent HFEs are identified. QU-C2 remains Not Met (F&O 6-30) HR-G7 remains Not Met (F&O 6-30)

Impact on SFCP	STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability. Additionally, this is a documentation issue with no impact on the PRA results.

F&O 6-50	Some of the MOVs credited in the ISLOCA Fault Tree are not tested to close against full DP. These MOVs are not originally included in the design as RCS isolation valves. Examples include 74-55 and 74-66 (note: this is not a complete list, but 2 of 4 valves reviewed were not in the MOVATs 89-10 program).
Associated (SRs) **IE-C11** **SY-A22**	**BASIS FOR SIGNIFICANCE** MOVs closing for ISLOCA are risk significant, with a RAW of greater than 2. **POSSIBLE RESOLUTION** Do not credit MOVs in the ISLOCA without verification the valves will close against full DP of RCS pressure. **PLANT RESPONSE** Assumption was added to the ISLOCA Notebook. Depressurization is not modeled in the ISLOCA initiator before valve closure. The probability of this failing to occur is only 5.077E-02. The fact that all ISLOCA events go directly to core damage without any mitigation actions is more than adequate to make up for not modeling the low probability of SRV failure.
Closure Review	**STATUS** Open **BASIS** A review of the ET representation identifies operator mitigation actions are included in the ET. This was also found to be the case when the ISLOCA modeling in the CAFTA model was reviewed (for example, gate U1_VRLOCA_002 includes gate U1_ISLV55_2 dealing with isolation). SY-A22 remains met at Cat II. The current model does not match the basis for resolution. Therefore, the F&O is not resolved. IE-C11 remains Met.
Impact on SFCP	Some impact expected on PRA results. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations affecting motor-operated valves (MOVs) credited for reactor coolant system (RCS) isolation.

F&O IFSN-A8-01	It was stated that no credit was taken for the removal of water via the drain system, with the exception that spray events (<=100 gpm). No scenarios were modeled that included backflow through drain lines. Although this is reasonable based on the layout of the large open areas in the Reactor Building and Turbine Building, no discussion of the elimination of backflow was provided in the documentation.
Associated (SRs)	**BASIS FOR SIGNIFICANCE**
IFSN-A8	Not provided **POSSIBLE RESOLUTION** Expand discussion in the internal flood notebook that explains how drain backflow was treated in the internal flood model. Include enough detail to justify screening. 1) What screening criteria was used? 2) How is the drain system configured? a. Are there separate drain systems in each building? (i.e. - RB, TB, CB, etc.) b. Can a drain line become blocked downstream? c. Where does the water end up? (Sump on lower level?, Holding tank?, Outside?) 3) Include general references that can be validated by the reviewer. (such as the system description and/or drawings used to support the assumptions for screening) 4) Is screening conservative? Why? This does not need to be a large effort but a statement that "any of the rooms within a building already show water propagating to the bottom elevation of that building" does not provide enough detail to demonstrate that the drain impacts were sufficiently assessed for screening. **PLANT RESPONSE** In the BFN Internal Flooding Analysis, it was determined that the only place that drain backflow could occur and potentially cause any issues would be in the lowest elevations of each building. The affect from this occurrence is already accounted for in each of the flooding scenarios as they all propagate to the lowest elevation. The drain lines are not connected for each building so water could not propagate from one building to another. The upper elevation drainage systems were not analyzed as a potential backflow situation as the drains are relatively small compared to the open hatches and stairwells that would cause the water to propagate to the lowest elevations. In addition, the areas in which the water would be susceptible to drainage are large rooms where the water would have to significantly fill in order to even reach a drain. Section 6.1.3 of the Internal Flooding Notebook explains that we screened drainage backflow from the analysis and why.

Closure Review	**STATUS** Open **BASIS** No formal closure review has been performed
Impact on SFCP	This is a documentation issue. Therefore, no impact is expected on the STI change evaluations performed in accordance with the SFCP.

F&O IFSN-A9-01	No specific flow rate calculations were performed. Flow rates were modeled to be the maximum flow rate for a given break category. For example, all flood events were assumed to result in a break flow of 2,000 gpm. This results in very conservative times to component failure. It could result in incorrect ranking of the risk importance of the flooding scenarios.
Associated (SRs) **IFSN-A9**	**BASIS FOR SIGNIFICANCE** Not provided **POSSIBLE RESOLUTION** As a minimum, perform calculations to estimate the actual flow rates of modeled breaks for the most risk significant scenarios. **PLANT RESPONSE** The BFN Internal Flooding Analysis conservatively assumed that the flows out of the pipe breaks were at the top end of each of the generic flow rate values. This was done to assure that we properly addressed the importance of each scenario. The pipe break frequencies are given for the range of flows and the frequency does not change whether the top end flow rate or a lower flow rate is used unless it changes which range of flows you are using. The only time you would be concerned with the flow rate would be when you are performing an operator action to prevent water accumulation within a room. The BFN Internal Flooding analysis did not credit any of these types of operator actions except for in the reactor building 519 elevation. The flow rates that could cause this elevation to flood could be from any water source in the Reactor Building so the highest flow rate possible for both the flood scenario and the major flood scenario was used in calculating timing for the HRA action. This gives the smallest possible timeframe with which to perform the action and ensures that the results are conservative and risk insights are reasonable.
Closure Review	**STATUS** Open

	BASIS No formal closure review has been performed
Impact on SFCP	This issue impacts time windows for operator response and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability. Additionally, the current PRA results are considered to be conservative.

F&O IFSN-A10-01	Spray events in the RB general areas (multiple elevations) are assumed to result in a manual trip and are analyzed. Larger flooding events are not considered an initiating event unless operators fail to isolate the flood prior to reaching the level of equipment damage (5') at the 519' elevation. This appears to be an inconsistency between the spray and flood events. Although less frequent than spray events, flood events in these areas could in total be a significant contributor to CDF.
Associated (SRs) **IFSN-A10** **IFEV-A1**	**BASIS FOR SIGNIFICANCE** Not provided **POSSIBLE RESOLUTION** Develop some initiating event that model floods in the general areas of the RB, along with successful isolation of the flood prior to equipment damage on the 519' elevation of the RB. Based on the results, determine whether, or not the entire group of these scenarios should be included in the IF model. **PLANT RESPONSE** When analyzing the spray events, it was assumed that for every spray scenario the operators would manually scram the reactor. This is a conservative assumption as the operators may not need to shutdown the plant. By analyzing every spray scenario with a manual scram we were able to see what the impact from a spray scenario would be to the plant. The flooding scenarios on the other hand, were not analyzed as during a Reactor Building flood scenario all of the water would propagate down to the 519 elevation of the Reactor Building. If the operators are successful in isolating the pipe rupture prior to reaching 5 feet in the 519 elevation, the plant would not necessarily be tripped. While it is true that some equipment might be lost which is similar to that seen for the spray events, the flooding analysis viewed the equipment impact separately from the flooding scenario as the flood has been terminated. Therefore the impact from the equipment being lost would be characterized by the internal events PRA model. Each of the Reactor Building flooding scenarios that are successfully mitigated by the HRA action for the 519 elevation submergence will be reviewed to determine whether a potential scenario would exist or not. In addition the Spray Scenarios will be reviewed to determine if those are potential scenarios or not as well and the results will be documented within the Internal Flooding Notebook.

Closure Review	**STATUS** Open **BASIS** No formal closure review has been performed
Impact on SFCP	This issue impacts potential flood initiating events, but the scenario response would be characterized by scenarios already modeled. STI changes are not affected by flood initiating events as the calculation determines the change in risk due to changes in reliability.

F&O IFSN-A10-02	Only a 2000 gpm flood initiating event was modeled in the Unit 1 SD Board Room A. Spray events were not modeled. Given that there are no drains nor indication that room (and an informal analysis) there is a possibility that a spray event of 100 gpm could also result in similar consequences.
Associated (SRs) **IFSN-A10**	**BASIS FOR SIGNIFICANCE** Not provided **POSSIBLE RESOLUTION** Perform a calculation at 100 gpm to determine whether or not a spray scenario is, in fact, a valid initiating event in this area. If so, include spray events in that area in the model. **PLANT RESPONSE** Each room was looked at for potential spray effects, including the 4KV Shutdown Board Room A. This Spray scenario is in the model as U1-621-R02_025_S with a contribution of 1.54E-10 to CDF which constitutes 0.002% of the Internal Flooding CDF for Unit 1. This spray scenario will be reviewed to ensure that it is treated appropriately within the model and any changes will be documented in the next revision of the internal flooding notebook.
Closure Review	**STATUS** Open **BASIS** No formal closure review has been performed
Impact on SFCP	This issue impacts potential flood initiating events, but the scenario response would be characterized by scenarios already modeled. STI changes are not affected by flood initiating events as the calculation determines the change in risk due to changes in reliability.

F&O IFEV-A1-01	For spray events in the general areas of the RB, all the possible spray frequencies were added to obtain on combined frequency for one event. The impact of this spray event was the combined impact of all the possible spray events on that elevation.
Associated (SRs) **IFEV-A1** **IFEV-A2**	**BASIS FOR SIGNIFICANCE** Not provided **POSSIBLE RESOLUTION** Separate out spray events in these areas to provide a better picture of which spray sources and which impacted equipment are the more significant contributor. **PLANT RESPONSE** For the general areas of the Reactor Building all spray scenarios were determined to occur at the same time and all equipment affected by a certain system piping were all failed. Because this is such a big room, this modeling approach was too conservative. Each of the spray scenarios within the general area of the Reactor Building will be reviewed to determine which components can be failed by what portions of piping and new scenarios will be developed to ensure that only the pipe ruptures that affect a component are used to fail a particular component.
Closure Review	**STATUS** Open **BASIS** No formal closure review has been performed
Impact on SFCP	This issue impacts potential flood initiating events, but the scenario response would be characterized by scenarios already modeled. STI changes are not affected by flood initiating events as the calculation determines the change in risk due to changes in reliability.

F&O IFQU-A6-01	The HRA assessment needs to incorporate several items: a) cues and indicators need to be documented in the first mitigation HRA (HFA_0_519FLOOD) b) with a), indicators should be assessed for flood damage c) PSFs need to be altered for general worst case in environment (radiation, etc.). This is because the flood mitigation actions are general and are not specific in place or time. d) Why is the belief in the adequacy of instruction set to no? For non-mitigation post initiator HRA's : a) Needs to discuss blocked path for each scenario
Associated (SRs) **IFQU-A6**	**BASIS FOR SIGNIFICANCE** Not provided **POSSIBLE RESOLUTION** Incorporate the missing pieces to the mitigation HRA's. a) cues and indicators for the first mitigation HRA (HFA_0_519FLOOD) b) with a), indicators should be assessed for flood damage c) Alter PSFs for general worst case in environment (radiation, etc.) d) Alter or add some discussion on why the Belief in Adequacy is set to "No" For non-mitigation post initiator HRA's : a) Discuss or incorporate blocked path for each scenario **PLANT RESPONSE** The HRA Assessment on HFA_0_519FLOOD was done generically as the only indication would be the Alarm coming in saying that there is water building up in the 519 elevation. The operator would be sent out to see if the alarm was valid and then try and isolate the pipe rupture. The Cues and Indicators will be updated to reflect the Alarm Indication. The flooding detectors are designed to get wet and would not be damaged by a flood. In addition there are multiple flooding detectors within the 519 elevation so if any of the detectors work, the operators would still be able to mitigate the flood. The belief in adequacy of instruction was set to No as the operators would most likely question whether there is an actual flood within the Reactor Building. The operators would still comply with the procedure and perform the action as stated. There is a timing aspect included that is to assess whether the flood actually occurred. The PSFs were reviewed to assess whether an operator would experience any adverse situation outside of what it would experience through everyday work. Because the flood and associated mitigation accident would occur prior to reactor trip, the shaping factors were consistent with a normal workload within the Reactor Building. Lighting would not be affected by the flood, heat/humidity would be normal for the areas that would be traversed. All of the areas within BFN are radiation areas so there is no increased stress from radiation, to isolate the pipe would be a simple action, and the stress was expected to be

	low as there is plenty of time to perform the action and it is expected that the action to close a couple of valves would not increase the stress on the operator. Each of the HRAs will be reviewed to determine what the impact would be from a blocked path and this will be documented within the internal flooding notebook.
Closure Review	**STATUS** Open **BASIS** No formal closure review has been performed
Impact on SFCP	This issue impacts operator response and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability. Additionally, this is primarily a documentation issue.

F&O IFQU-A9-01	No modeling of direct effects due to a flooding event were identified. The rational was, that for large flooding events in the RB, only those floods that resulted in flood levels reaching 5' in the 519' elevation were modeled. For those events, the required SSCs have failed due the indirect effects of the flooding. Therefore, the direct effects of the flooding need not be considered. It is our contention that floods in the RB that are successfully isolated before damage occurs to components on the 519' elevation should be included as initiators. These events will still result in damage to SSCs and direct failure to part of the breached system.
Associated (SRs) **IFQU-A9**	**BASIS FOR SIGNIFICANCE** Not provided **POSSIBLE RESOLUTION** Include floods on the RB elevations at 565' and above, even with successful isolation prior to equipment damage on the 519' elevation. For those events, model the direct failure of the breached system' **PLANT RESPONSE** This F&O is similar to F&O IFSN-A10-01. As mentioned in the response for that F&O, an operator may not need to scram the reactor for a loss of a component affected by a flooding event. Each of the Reactor Building flooding scenarios that are successfully mitigated by the HRA action for the 519 elevation submergence will be reviewed to determine whether a potential scenario would exist or not.

Closure Review	**STATUS** Open **BASIS** No formal closure review has been performed
Impact on SFCP	This issue impacts potential flood initiating events, but the scenario response would be characterized by scenarios already modeled. STI changes are not affected by flood initiating events as the calculation determines the change in risk due to changes in reliability.

3.4.3 Pending Model Updates Affecting IE With IF Modeling

A TVA Fleet procedure prescribes the process to ensure the PRA models represent the as-built, as-operated plant configurations in support of integrated decision-making and maintaining a high sensitivity for reactor safety in all activities, actions and responses. The requirement for both permanent and temporary changes to the plant design or operation is assessed by PRA Engineers that monitor changes to the plant design and operating procedures for impact on the PRA model. The PRA Engineer is responsible for ensuring that design changes that impact the PRA model are appropriately incorporated into the PRA model. Changes in PRA inputs or discovery of new information are required to be evaluated to determine whether such information warrants PRA update (including the cumulative effect of all previously evaluated model changes that are yet to be included in the MOR). Changes causing CDF or LERF to exceed a ±25% threshold are required to be tracked by initiating a Condition Report (CR). Potential and implemented plant configurations changes that do not meet the threshold for immediate update are required to be tracked in the PRA Model Open Items Database. A PRA update may be performed without incorporating all changes; however, unincorporated changes must not significantly impact the model. Any errors found in the site PRA program between periodic updates are documented by initiating a CR and entered into the corrective action program. A living model, which contains all model modifications that have been evaluated but not yet incorporated into the MOR is required to be maintained so that all future model modifications can be evaluated for cumulative impact on CDF and LERF.

The BFN living PRA model was reviewed for model modifications evaluated since the BFN PRA MOR Rev. 9 was issued. None of the pending changes meet the criteria for a non-scheduled PRA update and none meet the criteria for a model upgrade.

3.4.4 Identification of IE with IF Key Assumptions

The SFCP is a risk-informed process that considers both deterministic and probabilistic inputs in the decision-making process of extending STIs. The methodology employed recognizes a key area of uncertainty for this application, specifically, the standby failure rate used in the determination of STI extension impact. Therefore, the methodology requires the performance of selected sensitivity studies on the standby failure rate of the component(s) of interest for the STI assessment.

In general, the failure probability values of components used in PRAs consist of a time-related contribution (i.e., latent or standby time-related failures, or Common Cause Failure (CCF) rates) and/or a demand-related contribution (i.e., failure probability). The risk impact of a proposed STI change is required to be calculated as a change to the test-limited risk. Since the test-limited risk is associated with failures occurring between tests, the failure rate to be used in calculating the risk impact of a proposed STI change is the time-related failure rate associated with failures occurring while the component is in standby between tests (i.e., risk associated with the increased window of vulnerability to detect standby time related failures). Since the breakdown between time-related and demand-related contributions is unknown in the typical plant component failure rate database, all failures shall be assumed to be time-related to obtain the maximum test-limited risk contribution. The BFN PRA model, in general used the demand failure approach. In the demand failure approach, demand failure

probabilities were evaluated by Bayesian update using plant specific failure data (total number of demands and total number of failures) and generic data.

The impact of an STI change is evaluated using the following assumption:

$$Qd = \tfrac{1}{2}\lambda T$$

where, Qd = Demand Failure Probability
λ = Standby Failure Rate
T = STI (Surveillance Test Interval)

Therefore, if an STI increased from TC (Current Test Interval) to TP (Proposed Test Interval) by a surveillance frequency change, the demand failure probability will be assumed to increase from Qd to Qd*(TP/TC).

Relevant key assumptions may differ based on the equipment (system) being considered for an increase in the STI frequency. Therefore, for each STI considered for extension, assumptions will be reviewed and the impact of these key assumptions on the risk insights will be evaluated. The TVA process follows the requirement of NEI 04-10 in that sensitivity studies are required to be performed to ensure there is no undue reliance on key assumptions and causes of uncertainty.

3.4.5 Propagation of Uncertainty in the Model

Uncertainty is propagated through the model by using statistical distributions to represent the failure rates, probabilities, and frequencies represented by basic events throughout the model. Each basic event in the model is assigned a failure rate, probability, or frequency and the associated error factor is a measure of the confidence in that value. When UNCERT is executed, the software combines those failure rates, probabilities, and frequencies (and their associated error factors) through the model logic to determine a Core Damage Frequency/Large Early Release Frequency (CDF/LERF). This CDF/LERF has an associated error factor that is determined from the propagation of basic event uncertainty through the model. The methodology used for this propagation is a parametric uncertainty analysis using a Monte Carlo method in which a value is proposed for each basic event using its' uncertainty parameters. These new values are then used to calculate a new CDF/LERF. The process is repeated to the point when the UNCERT software collects the calculated CDF/LERF values and calculates various parameters of the resulting CDF/LERF distribution.

The PRAQuant software utilized to quantify the BFN fault tree model only uses the point estimates assigned to the basic events to calculate a point estimate CDF/LERF, therefore, the associated uncertainty parameters have no impact on the calculated point estimate CDF/LERF values. Since STI calculations are based primarily on CDF/LERF values using point estimates, the impact of the omission of CCF uncertainty parameters in the STI calculations is expected to be insignificant. Therefore, the results of gap analyses will not be integrated into the STI calculation.

3.5 Fire PRA Model and Peer Review

3.5.1 Fire PRA Peer Review Assessment

The BFN FPRA was subjected to two peer reviews: a full scope review and a follow-on review. A subsequent FSPR (discussed in Section 3.5.2) was conducted to assess the closure of the findings from the full scope and follow-on peer reviews. The FSPR was performed January 2012 and the follow-on peer review was conducted in June 2012. Both peer reviews used the NEI 07-12 process, ASME/ANS RA-Sa-2009, and RG 1.200, Revision 2. The purpose of these reviews was to establish the technical adequacy of the FPRA for the spectrum of potential risk-informed plant licensing applications for which the FPRA may be used. The FSPR examined all of the technical elements of the BFN FPRA against all technical elements in Part 4 of ASME/ANS RA-Sa-2009, including the referenced internal events SRs in Part 2. The follow-on peer review performed a review against a list of High Level Requirements (HLRs) and SRs that were selected based on the FPRA model changes implemented in the months that followed the full scope peer review in January 2012.

The FSPR generated a total of 130 F&Os, including 96 Findings. The follow-on peer review identified that a total of 66 F&Os from the initial peer review were considered resolved. However, the follow-on peer review also generated an additional 14 F&Os, and modified 12 of the F&Os from the full scope peer review. As a result, a total of 77 F&Os, including 55 Findings and 1 unreviewed analytical method (UAM) were considered open after the BFN FPRA follow-on peer review. Table 12 summarizes the peer review results.

Table 12 Fire PRA 2012 Follow-on Peer Review SR Capability Category Distribution

Capability Category	Number	Percent
Not Met	31	11
I	9	3
I/II	10	4
II	20	7
II/III	22	8
III	5	2
Met (All)	176	65
Not Applicable	147	N/A
TOTAL	**420**	**100%**

Fire PRA F&O Closure Review

In March 2013, BFN submitted a License Amendment Request (LAR) to adopt a new fire protection licensing basis that complies with the requirements in 10 CFR 50.48(a), 10 CFR 50.48(c), and the guidance in RG 1.205, Revision 1. This amendment request also follows the guidance in NEI 04-02, Revision 2, “Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c),” and the NFPA 805 standard, as supplemented by approved Frequently Asked Questions. Following the submittal of the LAR, BFN received and responded to many Requests for Additional Information (RAIs), which resulted in additional changes to the

FPRA model. This LAR was approved by the NRC on October 28, 2015 (ML15212A796).

An FSPR was conducted in May 2015, to review the BFN FPRA against selected technical elements from Part 4 of the ASME/ANS PRA Standard. The FSPR also assessed the closure of 68 F&Os resolved by TVA for the BFN FPRA, including one F&O identified and recommended for closure by the team review team. The review was conducted over a 4-day period by a team of four independent FPRA experts, and included a consensus process to determine the adequacy of the resolution to each reviewed Finding. Following the FSPR, nine F&Os which TVA identified as Open, were not in the review scope and remained open, including seven Findings. In addition, seven new F&Os were generated, including two findings.

The nine BFN FPRA Finding F&Os that remain open and their impact on the application are listed in Table 13.

The FSPR concluded that the BFN FPRA was complete and in an acceptable range to support risk-informed applications, was consistent with the ASME/ANS PRA standard, and could be continued to be used to support risk-informed applications.

Table 13 Fire PRA Open F&Os

F&O 2-38	The existing BFN procedures are based on the existing SISBO strategy and the current fire model is based on an as yet to be defined non-SISBO strategy for which there are no procedures yet in place. (This F&O originated from SR HRA-A2)
Associated (SRs) **FQ-D1** **HRA-A2**	**BASIS FOR SIGNIFICANCE** Analysis does not reflect the as-built as-operated plant **POSSIBLE RESOLUTION** When non-SISBO procedures are available, incorporate any new fire specific safe shutdown actions called out in the plant fire response procedures. **PLANT RESPONSE** Since the peer review, the BFN FPRA team has worked closely with the 805 transition team to match the FPRA recovery actions with those actions proposed and credited by the 805 transition team for the 805 RISK analysis. The FPRA team is only crediting those recovery actions that have been shown to sufficiently reduce CDF. A feasibility study has been performed to demonstrate that the credited actions can be performed in the available time. The TVA Fire PRA Post-Fire Human Reliability Analysis event timing information was obtained from two sources. The total time available was obtained from MAAP analysis. The cognitive and execution times were obtained both from a PRA practitioner who had previous knowledge of the IE HRA, and from operator. Timing information is documented in the HRA calculator files and in the operator interview forms. The operator interview forms instructed the operators to consider the assumed worst case conditions for performing the action with regard to workload, additional procedures, response time during fire conditions, travel time impacted by fire conditions, etc. The FPRA credited actions have been developed to the extent possible to make the HRA represent those proposed actions. The final fire procedures are not available to complete and verify the fire HRA. The FPRA model therefore assumes that these actions will be in the final procedures as currently proposed. The FPRA recovery actions will be reevaluated when the fire procedures are approved and ready to be implemented in the post 805 transition. This F&O is considered open until the procedures are finalized. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33).
Closure Review	**STATUS** Open **BASIS** Cannot be closed out until after the FPRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures

Impact on SFCP	This issue impacts operator response and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability.

F&O 2-39	Scoping as well as detailed (non-scoping) HRA analyses in some instances have no documentation of some or all of the following: applicable procedure(s), timing, cues, performance shaping factors and availability / adequacy of manpower. For one example, the main control room abandonment HRA is incomplete from the perspective that 1) the diagnosis related to making the decision to abandon control room appears to be unrealistically low (5E-4 with recovery), and 2) control of LPCI requires swapping the discharge from suppression pool cooling to injection, however, now diagnosis HEP is included for this action. (This F&O originated from SR HRA-B3)
Associated (SRs) **HR-G3** **HR-G4** **HR-G5** **FQ-D1** **HRA-B3** **HRA-C1**	**BASIS FOR SIGNIFICANCE** Systematic issue **POSSIBLE RESOLUTION** Complete the definition of HFEs including: applicable procedure(s), timing, cues, performance shaping factors and availability / adequacy of manpower. **PLANT RESPONSE** The TVA Fire PRA Post-Fire Human Reliability Analysis includes the significant non-MCR abandonment HFEs. The HFEs have been defined and analyzed to the extent possible utilizing currently available, but draft, procedures, timing, cues and performance shaping factors, including availability/adequacy of manpower. When the fire procedures have been completed, approved and adopted, verification must be made to ensure the fire HRA still sufficiently matches the final procedures. The main control room abandonment HRA has been expanded significantly since the peer review and the two specific F&O statements no longer apply. The concerns represented by these findings have been addressed. New abandonment HFE's have been developed and include detailed procedures, timing, cues and performance shaping factors, including availability/adequacy of manpower. As for the non-MCR actions (including the swapping of LPCI from suppression pool cooling to injection), when the fire procedures have been completed, approved and adopted, verification must be made to ensure the fire HRA's still sufficiently match the final procedures. This F&O is considered open until the procedures are finalized. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33).

Closure Review	**STATUS** Open **BASIS** Cannot be closed out until after the FPRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures
Impact on SFCP	This issue impacts operator response and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability.

F&O 2-50	The modeling of the human actions in the FPRA includes the consideration of instruments that are credited as cues. There are several instances that were noted where the listing of possible instrument cues includes many individual devices. This modeling is treated as multiple inputs to a single AND gate, as an example. As modeled, the availability of any single instrument even if the majority of the other instruments are failed, would not disable the human action. This treatment is made without any consideration of or confirmation that operator guidance is available to allow them to discern which instrument is the known valid (not failed) instrument. (This F&O originated from SR HRA-C1)
Associated (SRs) **HRA-C1**	**BASIS FOR SIGNIFICANCE** The treatment as modeled could conceal instances where instrumentation failures have a material impact on the HEP. Failure to address this situation could cause the analysis to apply invalid credit. **POSSIBLE RESOLUTION** A justification for the current modeling treatment needs to be provided. Such a justification would need to address he manner by which an operator would be able to discern which instrument should be used and/or how they would recognize the need for action even if the majority of the available instrument might indication that no action is required. In the absence of such a justification, a modification to the logic structure would be required.

	PLANT RESPONSE The TVA Fire PRA Post-Fire Human Reliability Analysis includes a discussion on the treatment of the instrumentation. Every routed instrument train that was credited by an HFE was included in the modeling. The redundant instruments are still AND'ed together and an assumption is made that the fire procedures will include the impacted instrumentation for fires in the respective area. Therefore, as long as one instrument is available and the operators know, from the applicable fire procedure, which instrument that is, that instrument can be credited even though the redundant instruments are impacted by the fire. This F&O is resolved to extent possible with the current state of the 805 project. The instrumentation cannot be listed in the fire procedures until the procedures are developed. Once the fire procedures are complete, approved and accepted, verification must be made to ensure the operator can determine from the fire procedure which instruments are free of fire damage for the applicable fire scenarios and those instruments are properly credited in the FPRA model. This F&O is considered open until the procedures are finalized. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33).
Closure Review	**STATUS** Open **BASIS** Cannot be closed out until after the FPRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures
Impact on SFCP	This issue impacts operator response and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability.

F&O 4-12	As documented in Section 6.2 of Component Selection report, a review of the fire emergency procedures (FEPs) or similar fire-related instructions was not conducted since the BFN fire safe shutdown strategies will updated as part of the NSCA. The FPRA therefore does not consider modifications of existing internal events accident sequences that will require modification based on unique aspects of the plant fire response procedures. This approach does not reflect the as-built as operated plant. (This F&O originated from SR PRM-B5)
Associated (SRs)	**BASIS FOR SIGNIFICANCE**
AS-A1 **AS-A5** **AS-A9** **PRM-B5**	Step not performed

	POSSIBLE RESOLUTION Consider modifications of existing internal events accident sequences that will require modification based on unique aspects of the plant fire response procedures when it is available. **PLANT RESPONSE** The TVA Fire PRA Post-Fire Human Reliability Analysis includes a review of the EOIs for all three units. The fire procedures when complete will be reviewed for infeasible operator actions. If undesired operator actions are identified, either the procedure will be modified to eliminate the potential action or the potential action will be modeled and its risk significance determined. This review will include the main control room abandonment procedures. If modifications to the existing internal events accident sequences require modification based on unique aspects of the plant fire response procedures after the procedures are approved, the Fire PRA Component Selection will be updated to reflect the required changes. This F&O is considered open until the procedures are finalized. The fire HRA will be updated upon completion of procedure updates, modifications and training. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33).
Closure Review	**STATUS** Open **BASIS** Cannot be closed out until after the FPRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures
Impact on SFCP	This issue may result in modification to accident sequences, which may have an impact on FPRA results. Impact of this finding on the SFCP is expected to be assessed in case-by-case STI evaluations affecting components related to the fire safe shutdown strategy and plant fire response.

F&O 4-17	In considering whether there are possible new scenarios not addressed in the Internal Events PRA that should be considered for the Fire PRA resulting in additional equipment that needs to be included in the Fire PRA, Section 6.2 states that the following was performed with the observations documented. (1) Considered sequences screened out of the Internal Events PRA that may become relevant to the Fire PRA and need to be implemented in the Fire PRA Model. A review was conducted for such scenarios, originally eliminated from the Internal Events PRA, to determine if the analyst needs to add components to the Fire PRA Component List, as well as, model those components (and failure modes) in new sequences in the Fire PRA Model; (2) Considered the possible effects of spurious operations that may result in new accident sequences and associated components of interest that should be addressed in the Fire PRA and go beyond considerations in the Internal Events PRA. Typically, these new sequences arise as a result of spurious events that cause a LOCA: e.g., spurious opening of safety relief valves, Adversely affect plant pressure control: e.g., safety relief valve events, Allow overfill situations: e.g., reactor vessel overfill that if unmitigated could subsequently fail credited safe shutdown equipment such as HPCI or RCIC pumps, or Introduce other “new” scenarios that may not be addressed in the Internal Events PRA; and (3) A review of the fire emergency procedures (FEPs) or similar fire-related instructions was not conducted since the BFN fire safe shutdown strategies will updated as part of the NSCA. To the extent that the associated human actions and their effects will be explicitly included in the Fire PRA Model, new sequences and corresponding components may need to be included in the Fire PRA. It should be recognized that some of the human actions from these potentially new sequences may have to be addressed in the Fire PRA. Examples are: The Internal Events PRA likely will not have addressed main control room abandonment scenarios where fire-specific operator actions and equipment sets are relied upon; Fire specific manual actions designed to preclude or overcome spurious operations will likely not have been addressed in the Internal Events PRA. Other procedural actions may address a degraded barrier, or deal with a breaker coordination problem, among others; Fire specific manual actions may cause intentional failure of a safe shutdown function or a subset of that functional response. For example, a proceduralized action may be to trip a power supply thereby disabling (“failing”) certain equipment in the plant. The effect of this action should be implemented in the Fire PRA Model by acknowledging the affected components in the Fire PRA Component List and noting the success of the proceduralized human action as a “failure mode” of that component in the Fire PRA Model (including any new resulting accident sequences as appropriate). Table 9 of the CS notebook provides this review for new accident sequences. However, Table 9 does not provide much information. It lists the following considerations: Spurious opening of one or more safety relief valves, Spurious closure of all MSIVs, Loss of Condenser Vacuum, Loss of Feedwater, and Turbine Bypass Unavailable. The expectation would be to document the entire review to accomplish the above steps, such as (examples only) 1) examining all MSO scenarios for potentially new accident sequences (e.g., overfill as an initiating event); 2) fire-induced floods, from causes such as: a. system relief valves opening due to system over pressurization that result from spurious operations (not the SRVs, but relief valves designed to protecting from system overpressure), b. spurious opening of system drain valves, or c. water hammer; examples are: i) fire water system actuates and isolation valve spuriously closes, ii) keep fill pump for injection system fails, pump outlet piping drains and pump starts, iii) drain valve spuriously opens on pump outlet piping, draining the piping and pump receives signal to start, etc. d. fire-specific ISLOCA leakage sources; 3) Loss of power to the control room annunciator tile boards. (This F&O originated from SR PRM-B5)

Associated (SRs)	**BASIS FOR SIGNIFICANCE**
AS-A5 **PRM-B5**	Insufficient documentation
	POSSIBLE RESOLUTION
	Document a review of any new accident sequences, including timing considerations not in the internal events, including a review of fire emergency procedures.
	PLANT RESPONSE
	A review was conducted of 1) screened initiating events from the internal events PRA model documentation, and 2) MSO impacts on plant safe shutdown and on the potential for new initiating events. The results of this review are documented in the Component Selection report. The review included an evaluation of generic and plant specific MSO scenarios to identify the potential for any unique failure impacts. No new sequences were identified which were not already included in the Fire PRA model, or adequately addressed by system logic models as modified for the Fire PRA. A review of fire emergency procedures will be performed after procedure development is complete
Closure Review	**STATUS**
	Open
	BASIS
	Cannot be closed out until after the FPRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures
Impact on SFCP	This is a documentation issue. Therefore, no impact is expected on the STI change evaluations performed in accordance with the SFCP.

F&O 4-21	The review of EOIs and annunciator response procedures for instruments applicable to undesired operator actions is documented in Section 5.6.1 and 5.6.2 of HRA notebook, and Attachment F. However, fire emergency procedures and control room abandonment procedures were not reviewed, since these procedures employ the SISBO approach. Therefore, review is not for the as-built as operated plant. (This F&O originated from SR ES-C2)
Associated (SRs) **ES-C2** **FQ-D1** **HRA-A3**	**BASIS FOR SIGNIFICANCE** Incomplete analysis **POSSIBLE RESOLUTION** N/A **PLANT RESPONSE** The TVA Fire PRA Post-Fire Human Reliability Analysis includes a review of the EOIs for all three units. The fire procedures when complete will be reviewed for infeasible operator actions. If undesired operator actions are identified, either the procedure will be modified to eliminate the potential action or the potential action will be modeled and its risk significance determined. This review will include the main control room abandonment procedures. This F&O is considered open until the procedures are finalized. The fire HRA will be updated upon completion of procedure updates, modifications and training. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33).
Closure Review	**STATUS** Open **BASIS** Cannot be closed out until after the FPRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures
Impact on SFCP	This issue may result in additional operator actions and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability.

F&O 9-4	All of the recovery actions were not included in the dependency analysis.
Associated (SRs) **HR-H3** **FQ-A3** **FQ-D1** **HRA-D2**	**BASIS FOR SIGNIFICANCE** Incomplete dependency analysis.
	POSSIBLE RESOLUTION Ensure all recovery actions are included in the final dependency analysis. **PLANT RESPONSE** All of the recovery actions used by the Fire PRA have been included in the dependency analysis. The dependency analysis is documented in the TVA Fire PRA Post-Fire Human Reliability Analysis. Since the peer review, the BFN FPRA team has worked closely with the 805 transition team to match the FPRA recovery actions with those actions proposed and credited by the 805 transition team for the 805 Risk analysis. The FPRA team is only crediting those recovery actions that have been shown to sufficiently reduce CDF. The FPRA credited actions have been developed to the extent possible to make the HRA represent those proposed actions. The final fire procedures are not available to complete and verify the fire HRA. The FPRA model therefore assumes that these actions will be in the final procedures as currently proposed. Before the FPRA recovery actions can be considered complete, they will have to be reevaluated when the fire procedures are approved and ready to be implemented in the post 805 transition. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33). This F&O is considered open until the procedures are finalized. The fire HRA will be updated upon completion of procedure updates, modifications and training. (Refer to BFN NFPA 805 LAR Attachment S, Table S-3, Item 33).
Closure Review	**STATUS** Open **BASIS** Cannot be closed out until after the PRA had been updated following completion of the NFPA 805 modifications and completion of the post-transition safe shutdown procedures
Impact on SFCP	This issue impacts operator response and HEPs. STI changes are not affected by HEPs as the calculation determines the change in risk due to changes in reliability.

F&O PRM-B9-01	This F&O supersedes and incorporates the issues identified in F&O 9-2 from the BFN FPRA 2012 follow-on peer review. The wording from 9-2 is: "The new Safe Shutdown Injection Pump is currently modeled as a single event with a probability of 0.1. This system is still in the conceptual phase. This F&O is written as a placeholder to model the system in detail at some future date." The purpose of this F&O is to ensure that the as-built of the Emergency High Pressure Makeup (EHPM) System clearly documents the following in order to fully comply with standard ASME-RA-S-2009 (latest revision). § Key safety functions satisfied by the system - § Success criteria for the system § Ensure the as-built modification does not introduce any new initiating events during any plant mode of operation § Phenomenological effects on the system § System dependencies such as cooling, electrical, etc. § Time dependencies such as water volume depletion § Key assumptions § Any unit cross connects and their effect on success criteria , accident progression and new initiating events § Review any relevant plant experience to ensure potential for new initiators is addressed and any precursor for an initiating event is addressed § Potential for common cause failures
Associated (SRs)	**BASIS FOR SIGNIFICANCE**
PRM-B9	Ensure complete documentation so that the as modeled fire PRA aligns with the as-built and as-operated plant and is compliant with the ASME standard. **POSSIBLE RESOLUTION** Follow established processes for a new system and ensure the system notebook documents items listed above as well as listing components in the component selection notebook and follow appropriate protocols. **PLANT RESPONSE** N/A
Closure Review	**STATUS** Open **BASIS** Generated during focused scope peer review in 2015.
Impact on SFCP	This is a documentation issue. Therefore, no impact is expected on the STI change evaluations in accordance with the SFCP.

F&O CF-A1-01	The revised methodology for CFMLA is consistent with the latest industry guidance in NUREG/CR- 7150, Vol. 2. A review of likelihood values assigned identified some anomalies for specific circuit configurations related to Design Change Notice (DCN 71214). This DCN electrically reconfigures the control circuit for Unit 1, 2, and 3 RHR System valves to resolve spurious operation of these valves. 1-FCV-074-0060, 1-FCV-074-0071, 1-FCV-074-0074, 2-FCV-074-0057, 2-FCV-074-0060, 2-FCV-074-0071, 2-FCV-074-0074, 3-FCV-074-0057, 3-FCV- 074-0060, 3-FCV-074-0074 DCN 71214 is intended to prevent spurious operation of the components except at cable endpoints. The spurious operation probabilities assigned for these valves are assigned a value of zero except for areas of the endpoints, where a spurious operation value is provided. Several issues were identified: 1) Panel Wiring - The spurious operation value of 1.30E-02 is provided, which corresponds to single break circuits, ungrounded ac, thermoplastic insulated cable spurious operation probability for inter-cable hot shorts (Table 8-1 NUREG/CR-7150, Vol. 2). However, the failure mode of concern does not appear to account for the electrical panels where the cables terminate. NUREG/CR-7150 Volume 2, Section 7.4 provides the following guidance for panel wiring. <u>Panel Wiring</u> There are no test data for evaluating the likelihood of hot short-induced spurious operations for panel wiring. A hot short in the panel wiring's conductor bundles within a cabinet could behave similarly to any of the failure modes of an electrical cable (i.e., intra-cable, inter-cable, or GFEHS) depending upon the proximity of the conductors to the fire and the tightness of their bundles. The conditional probability of hot short-induced spurious operation most likely is affected by the configuration and tightness of the conductor bundles, along with the proximity of source and target cables. Considering the lack of applicable test data and the potential risk importance of panel wiring, the PRA panel recommends using aggregate values in the tables in Sections 4 and 5. The aggregate value for Table 8-1 of NUREG/CR-7150, Vol. 2 for Ungrounded ac, thermoplastic insulated cable spurious operation probability for MOVs is 0.39. Therefore, by applying value for inter-cable hot shorts exclusively in a fire area, it may not account for the higher spurious operation probability for the panel wiring. 2) Alignment with Modification - In addition, based upon discussion with TVA and PRA project staff, it appears that the values proposed were based on routing of the spurious operation target cable in conduit. The proposed treatment was that the cable in conduit routed in endpoint fire areas would be subject to spurious operation (i.e., not provided with shielded, braided protection). The modification was going to provide shielded braided cable for the entire route of the target cable, except at the specific terminal locations and not be subject to spurious operation, except at the terminal endpoints (i.e., the potential spurious operation of the target cable in conduit was not part of the proposed design). Therefore, the CFMLA modeling described did not appear to match the proposed modification. While it is expected that checks and balances in the plant modification process could refine the CFMLA following completion of the modification, the current treatment of the proposed modification does not appear to align with the modification or industry guidance.

Associated (SRs)	**BASIS FOR SIGNIFICANCE** Failure to accurately represent the modification could potentially result in mischaracterization of the fire risk associated with spurious operation of the valves and the modification. Use of the inter-cable spurious operation values instead of the aggregate values per the guidance in NUREG/CR-7150 could under-estimate the risk of spurious operation of the valves for fires that impact the cable endpoints.
CF-A1	Update the treatment of spurious operation of these valves to align with the modification scope **POSSIBLE RESOLUTION** Review the treatment of spurious operations of panel wiring and update the treatment per NUREG/CR-7150, Volume 2, if the risk significance of the scenarios warrants this treatment (per SR CF-A1). Note that these modifications have not yet been implemented in the Fire PRA results. Alternatively, additional design measures could be implemented to reduce the vulnerability of the panel wiring to hot short induced spurious operation. **PLANT RESPONSE** N/A
Closure Review	**STATUS** Open **BASIS** Generated during focused scope peer review in 2015.
Impact on SFCP	This issue impacts the treatment of spurious operation events due to fire. STI changes are not affected by spurious operation events as the calculation determines the change in risk due to changes in reliability.

3.5.2 Pending Model Updates Affecting Fire PRA

The BFN living PRA model was reviewed for model modifications evaluated since the BFN PRA MOR Rev. 8 was issued. None of the pending changes meet the criteria for a non-scheduled Fire PRA update and none meet the criteria for a model upgrade.

3.5.3 Identification of Fire Key Assumptions

A number of assumptions and areas of uncertainty have been identified for the BFN FPRA; sensitivity cases were evaluated for each of the identified areas of uncertainty. The impact on CDF/LERF has been characterized as minimal to small, with the exception of four cases judged to have moderate impacts: credit for automatic suppression, value of human error probabilities, use of alternate cabinet Heat Release Rates (HRRs) in certain compartments, and use of NUREG/CR-6850 ignition source frequencies The SFCP assesses the change in CDF/LERF, cumulative risk and sensitivity studies, and does not rely on importance measures for the characterization of risk impact for a given STI extension.

The FPRA UNCERT Notebook lists and characterizes FPRA assumptions and uncertainties for the FPRA model and associated documentation. The TVA Technical Instruction governing the SFCP process requires key assumptions and key modeling uncertainties to be addressed to ascertain sensitivity of these on the proposed STI extensions and included in the documented evaluation for IDP consideration.

3.6 Seismic PRA Model and Peer Review

3.6.1 Seismic PRA Peer Review and Assessment

The Browns Ferry Seismic PRA (SPRA) model was developed to provide a clear understanding of the increased seismic risk is a vital part of TVA's mitigating strategy to comply with the March 12, 2012 50.54(f) Request for Information (RFI), enclosure 1, Recommendation 2.1 Seismic. TVA, in alignment with proposed industry guidance known as the Augmented Approach, intends to perform a two-phased approach to achieve the desired risk insight and comply with the RFI. The SPRA project evaluated the seismic hazard for BFN in accordance with the NRC 50.54(f) RFI and provided an SPRA including a peer review in accordance with the Screening, Prioritization, and Implementation Details (SPID), EPRI Report 1025287 requirements. The SPRA complies with Regulatory Guide 1.200, ASME/ANS RA-Sa-2009 (Capability Category II) and other applicable regulatory and standard requirements. The Browns Ferry SPRA does not credit non-safety related equipment with exception to cases where offsite power remains available to supply safety-related equipment, nor does it credit FLEX equipment with exception to use of a nitrogen bottle as backup to control air for the hardened wetwell vent.

The peer review used the NEI 12-13 process[2] and the PRA Standard (ASME/ANS RA-Sb-2013, Code Case 1).[3] The review of the SPRA was a full-scope review of all the

[2] The peer review followed the NRC letter dated March 7, 2018, "U.S. Nuclear Regulatory Commission Acceptance of Nuclear Energy Institute (NEI) Guidance NEI 12-13, 'External Hazards PRA Peer Review Process Guidelines' (August 2012)," (ML18025C025).

[3] In 2018, Code Case 1 of Addendum B to the ASME/ANS PRA Standard, which allows an alternate way to comply with the standard for SPRA, was approved by the American National Standards institute.

seismic technical elements of the Code Case. The team consisted of eight members having extensive qualifications in all areas of SPRA as required by NEI 12-13. All 95 individual supporting requirements from Code Case 1 were considered by the peer team. About 6% were determined to not be applicable to Browns Ferry. The balance are supportive of Capability Category II or greater. A total of 34 finding level F&Os were documented.

Seismic PRA F&O Closure Review

The Browns Ferry SPRA F&O Closure Independent Assessment (IA) was performed in accordance with Appendix X of NEI 12-13 to review resolution of finding level F&Os against the requirements of ASME/ANS RA-Sb-2013, Code case 1. The highly qualified team of six members met the requirements of NEI 12-13 and ASME/ANS Standard RA-Sa-2009 Section 1-6.2. All F&O closures were determined to be PRA maintenance, and therefore, no closure resolution resulted in an upgrade. No finding level F&Os remain open.[4]

3.6.2 Pending Model Updates Affecting Seismic PRA

The PRA database of pending model changes was reviewed and it was determined that there are no pending SPRA model changes.

3.6.3 Identification of Seismic Key Assumptions

The SPRA built off of the Full-Power Internal Events (FPIE) PRA; therefore, any assumptions that are key in the FPIE PRA are also key assumptions for the SPRA. The SPRA model and documentation were reviewed to determine the potential impact of the assumptions used. Expert elicitation and comparison to existing seismic PRAs was also used to determine the potential impact of the assumptions and uncertainties used in the SPRA. These included assumptions and uncertainties associated with the hazard analysis, the fragility analysis and the PRA model. The internal events PRA documentation was also systematically reviewed and the assumptions determined to be applicable to the SPRA were incorporated into the model. One criteria for determining risk-significant (key) components in the PRA included those with a Fussell-Vesely (F-V) measure of 0.005 or greater. These components were subjected to a detailed fragility analysis. Each of the identified assumptions and potential sources of uncertainty were categorized as to whether the it had an impact on the SPRA model and if so whether the potential impact was negligible, small, medium or large.

The impact of key sources of uncertainty or assumptions on the SFCP application is determined during the evaluation of an STI increases by use of sensitivity analyses. The impact is included in the STRIDE (Surveillance Test Risk-Informed Documented Evaluation) and presented to the Integrated Decision-Making Panel (IDP) for consideration.

NRC accepted the use of this Code Case for all risk-informed applications by letter issued in March 12, 2018.

[4] The SPRA F&O Closure Report addressed the NRC staff expectations contained a letter dated May 1, 2017, "U.S. Nuclear Regulatory Commission Staff Expectations for an Industry Facts and Observations Independent Assessment Process," (ML17121A271).

3.6.4 STI Considerations of SSCs Not Evaluated in the SPRA

An SSC screening process was used in the development of the SPRA. For example, SSCs that were deemed "seismically rugged" were screened out. The TVA SFCP process for extending STIs follows the NEI 04-10 guidance. SSCs that are not evaluated in the seismic PRA, either explicitly or implicitly, follow the NEI 04-10 process in that the analyst determines if the SSCs associated with the surveillance test(s) are adequately included in the base PRA. If the associated equipment can be modeled, then the SFCP model is revised to reflect those SSCs. For those SSCs that cannot be adequately modeled, a qualitative or bounding analysis is performed in accordance with the process outlined in NEI 04-10 Step 10. NEI 04-10 Step 10 states, if the SSC is not evaluated in the seismic PRA, (either explicitly or implicitly, and it is judged to have no impact on the PRA results), then the SSC can be qualitatively screened. In Step 10a, a qualifier is provided in that the qualitative information is sufficient to provide confidence [for the Integrated Decision-making Panel (IDP)] that the net impact if the STI change would be negligible (or zero) from a CDF and LERF perspective. If the qualitative information is not sufficient to submit to the IDP, a bounding analysis is performed in accordance with Step 10b. Bounding analyses are performed for those SSCs that are not explicitly modeled in the PRA model, but rather are implicitly included in the model at the initiating event, mitigating system, or functional level. In that case, a basic event (or basic events) associated with the initiating event, mitigating system, or function is identified to use as surrogate for the SSC to be investigated. Reasonable variations to the basic event value(s) are then be explored to determine the potential bounding impact of the STI change.

Alternative evaluations for the impact from seismic events are also deemed acceptable at this point. For example, if the ΔCDF and ΔLERF values have been demonstrated to be very small from an internal events perspective based on detailed analysis of the impact of the SSC being evaluated for the STI change, and if it is known that the CDF or LERF impact from the seismic event is not specifically sensitive to the SSC being evaluated (by qualitative reasoning), then the detailed internal events evaluations and associated required sensitivity cases (as described in Step 14) can be used to bound the potential impact from external events and shutdown PRA model contributors. Another example is if the ΔCDF and ΔLERF values have been demonstrated to be very small from an internal events perspective based on detailed analysis of the impact of the SSC being evaluated for the STI change, and if it is known that the plant CDF and LERF results of the seismic event are much smaller than the corresponding values for the internal event full power PRA, then the results of the internal events analysis alone would suffice for the STI consideration. This example is likely to be applicable for a situation where the SSC associated with the STI change is modeled in the internal event full power PRA but not in the seismic event hazard.

4 NON-PRA MODELED EXTERNAL EVENTS CONSIDERATIONS

The NEI 04-10 methodology allows for STI change evaluations to be performed with non-PRA approaches with respect to Internal Fire Hazards (e.g., EPRI's Fire Induced Vulnerability Evaluation), Seismic Hazards (e.g., a Seismic margins Analysis), and Assessment of Other External Hazards (e.g., a screening methodology). With respect to assessment of Shutdown Events, NEI 04-10 allows for use of a shutdown safety program developed to support implementation of NUMARC 91-06. BFN uses all of the above

alternative approaches to assess risk in support of the SFCP with the exception of fire and seismic hazards, for which BFN has an FPRA and an SPRA.

For the assessment of other non-modeled external hazards, a qualitative or a bounding approach will be used, as applicable, and supplemented with insights from the Internal Events PRA model.

4.1 High Winds, External Flooding and Other External Hazards

The BFN Individual Plant Evaluation for External Events (IPEEE) analysis of Seismic, High Winds (Including Tornadoes), External Floods, Transportation, nearby Industrial Facilities and other external hazards was accomplished by reviewing the plant environs against the regulatory requirements (Generic Letter 88-20 Supplement 4) regarding these hazards. No other external events (e.g., volcanic activity) are applicable to the Browns Ferry Site. The analysis of High Winds (Including Tornadoes), External Floods, Transportation, nearby Industrial Facilities and other external hazards was documented in the July 1995 submittal. The overall conclusion was that Browns Ferry is well designed and capable of withstanding severe external challenges. Additionally, BFN confirmed that no other plant-unique external events with potential severe accident vulnerability are being excluded from the IPEEE.

Subsequently, the ability of BFN to withstand severe external hazards was re-evaluated using a progressive screening approach. As shown in Table 16, all external hazards meet the screening requirements with the exception of internal fires, seismic activity and internal flooding. Full PRAs have been developed for these hazards.

Table 14 External Hazards IPEEE and Current Applicability

Event	BFN IPEEE Applicability	Current Applicability
Seismic Activity	A modified site specific program was used in the IPEEE.	Replaced by the SPRA Model
Internal Fires	The EPRI Fire Induced Vulnerability Evaluation (FIVE) approach was used in the BFN IPEEE. It was confirmed that there are no fire-induced vulnerabilities associated with continued operation of BFN.	Replaced by the FPRA Model
Extreme Wind or Tornado	The maximum wind speed for the Browns Ferry design basis tornado is 300 mph. All class I structures and components have been designed to maintain integrity when exposed to a 300 mph tornado. Structures and components that cannot withstand tornado loads were found not to perform any safety-related function nor disable the safety function of safety-related structures, systems and components. The high winds hazard to core damage frequency is less than 10-6 per year.	The basis for screening High Winds and Tornadoes, remains applicable to the current plant design. Site procedures provide instruction for actions to be taken in the events of a Tornado Watch or a Tornado Warning issued for Limestone County. These actions further mitigate the potential consequences of an event.
External Flooding	External floods defined as the most severe reasonable possible flood were analyzed to include excessive rainfall, storms, wind waves and potential dam failures. Maximum flood records, varying storm arrangements and excessive headwater level calculations were performed to produce the critical PMF discharge and elevation at BFNP. PMF conditions can occur while maintaining minimum RHRSW flow and shutdown requirements of greater than 80 cfs to the plant. Safety-related structures can withstand flood conditions up to PMF. Core damage frequency from a flood hazard is quantified to be less than 10-6 per year which adheres to the criteria of the 1975 SRP. Snowfall is not a factor in determining maximum flood levels due to snowfall levels being relatively light for this area.	The basis for screening external flooding, remains applicable to the current plant design.
Transportation and Nearby Facility Accidents	The impact of potential transportation and nearby facility accidents were evaluated and concluded that their contribution to plant risk is negligible.	Potential accidents due to river transport identifies no vulnerabilities and conforms to the design basis. Of the chemicals transported by the site by pipeline, barge, rail or road within a 5-

Event	BFN IPEEE Applicability	Current Applicability
		mile radius, only chlorine traveling by barge could present a hazard to control room personnel. The probability of released chlorine exceeding the concentration limits in RG 1.78 is less than 1.0E-6 events per year, and this can be excluded from consideration. If a coal barge were to sink in the channel, flow to intake pumping station would not be blocked. There are no highways which penetrate the site boundary. Description provided in the Final Safety Analysis Report (FSAR) of the locations and distances of transportation facilities in the vicinity of the plant meets the acceptance criteria of the 1975 Standard Review Plan (SRP). There are no railroads that enter the site boundary. Description provided in the FSAR of the locations and distances of transportation facilities in the vicinity of the plant meets the acceptance criteria of the 1975 SRP. There are twelve industrial facilities within 5 to 10 miles of the plant. The nearest military facility is the Redstone Arsenal 25 miles east of the plant. There are no industrial or military facilities located within a 5-mile radius of BFN where stored chemicals could cause a potential plant hazard. There are no airports within five miles of the site. The Athens-Decatur Airport is about 10 miles east of the plant. The nearest commercial airport is located in Huntsville about 25 miles from the site. The likelihood of an aircraft crash as with other severe rail and traffic transportation accidents that results in significant damage is vanishingly small.
Other External Hazards	All external other external hazards have been screened based on generic data (e.g., Lightning), site location (e.g., Volcanic Activity), generic bases (e.g., Extraterrestrial Activity), low probability of occurrence (e.g., Turbine Missiles).	Other external hazards are judged to remain screened based on the initial preliminary and progressive screening criteria outlined in the ASME/ANS PRA Standard.

4.2 Shutdown Events Consideration

Browns Ferry operates under a shutdown risk management program consistent with NUMARC 91-06. The Shutdown Risk implementing procedure provides guidance for outage risk management which focuses on proper planning, conservative decision-making, maintaining defense-in-depth, and controlling the key safety functions. BFN will use the shutdown risk management program procedures to assess the potential impact on shutdown risk for proposed STI extensions, consistent with the guidance afforded by NEI 04-10. Qualitative information will be developed that supports the acceptability of the STI change with respect to shutdown risk, unless it can be screened as not having an impact on CDF and LERF.

5 GENERAL CONCLUSION REGARDING PRA CAPABILITY

The Browns Ferry PRA maintenance and update process and technical capability evaluations described above provide a robust basis for concluding that the PRA is suitable for use in risk-informed licensing actions. As specific risk-informed PRA applications are performed, remaining gaps to specific requirements in the PRA standard will be reviewed to determine specific surveillance test interval extension specific additional analysis, i.e., sensitivity studies.

6 PRA ASSESSMENT OF PROPOSED STI EXTENSIONS METHODOLOGY

The Systems, Structures and Components (SSCs) identified as affected by a proposed surveillance frequency extension are evaluated by the BFN PRA. The TVA process follows the endorsed NEI 04-10 guideline.

TVA's Sequoyah Nuclear (SQN) Plant has implemented the Surveillance Frequency Control Program and uses Fleet procedures that provide the procedural requirements for the PRA methodology for evaluating changes to STIs. These procedures will be used by BFN for assessing the change in risk associated with STI extensions. The procedures are consistent with the PRA requirements delineated in the NEI 04-10 guidance.

6.1 Key PRA Attributes of the SFCP Procedures

The SFCP PRA procedure allow a blended approach to assessing the change in risk associated with a change to an STI. This includes approved probabilistic risk models as well as non-PRA methodologies.

Hazards to be Evaluated:

- Internal Events at Full Power (which includes internal flooding)
- Internal Fire Events
- Seismic Events
- Other External Hazards (e.g., high winds, flooding, etc.)
- Shutdown Events

6.1.1 Identify the Scope of Risk Contributors Assessed by the PRA Model

- if not full scope (i.e., internal events with internal flooding, non-screened external events, all modes), identify appropriate compensatory measures

or provide bounding arguments to address the risk contributors not addressed by the PRA model.

6.1.2 Identify Pieces of the PRA Used to Support an STI Extension

- identify structures, systems and components (SSCs), operational characteristics affected by the proposed change and how these are implemented in the PRA model.

6.1.3 Demonstrate the Technical Adequacy of the PRA

- identify plant changes (design or operational practices) that have been incorporated at the site, but are not yet in the PRA model and justify why the change does not impact the PRA results used to support the application
- document peer review findings and observations that are applicable to the parts of the PRA required for the application, and for those that have not yet been addressed justify why the significant contributors would not be impacted
- document that the parts of the PRA used in the decision are consistent with applicable standards endorsed by the Regulatory Guide (currently, RG 1.200, Revision 2). If applicable, provide justification to show that where specific requirements in the standard are not adequately met, it will not unduly impact the results
- identify key assumptions and approximations relevant to the results used in the decision-making process

6.1.4 Summarize the Risk Assessment Methodology Used to Assess a Proposed STI Extension

- include how the PRA model was modified to appropriately model the risk impact of the proposed STI extension

6.1.5 PRA Technical Adequacy Requirements Summary

RG 1.200, Revision 2 provides the requirements to assess the PRA technical adequacy of a PRA to support an application, as listed in Table 15. The indicated sections of the RG are satisfied by the listed section of this evaluation.

Table 15 PRA Technical Adequacy Summary

RG 1.200 Section	Description	Requirement Satisfied by Section(s)
3.1	Scope of Risk Contributors Addressed by the PRA Model	4.1.1
3.2	Identification of Pieces of a PRA Used to Support the Application	4.1.2
3.3	Demonstration of Technical Adequacy of the PRA	4.1.3
4.2	Licensee Submittal Documentation	2, 3 and 4
The SFCP, also referred to as Risk-Informed Technical Specification 5b, is a broad scope application that will have varying risk assessment details and combinations of allowed risk assessment details dependent on the		

scope and system for the proposed Surveillance Test Interval extension. The items required by RG 1.200 Sections 3.1, 3.2 and 3.3 will be addressed and documented by a Surveillance Test Risk-Informed Documented Evaluation (STRIDE) package that will be reviewed and approved by the IDP prior to making a change to an STI. RG 1.200 Section 4.2 is addressed.

6.1.6 Risk Metrics

When possible, the quantified approach determines the impact on both the change in CDF and LERF for the proposed STI extensions. The TVA procedural limits for the change in risk is consistent with those prescribed by NEI 04-10.

The quantified approach uses the limits defined in the NEI 04-10 guidance for change in CDF and LERF from the internal events PRA model. Other metrics include the total (from all PRA models) and the cumulative effect on CDF and LERF. All TVA risk limits are consistent with those in Steps 10 through 12 from NEI 04-10.

6.1.7 Cumulative Risk

The cumulative risk analysis compares the change in risk for all approved STI extensions and the extension under consideration that have not been rolled into the MOR. This assessment is not a summation of all previously approved extensions, but a requantification of the model that includes all affected SSCs for that population of STRIDEs. The delta from the baseline model represents the cumulative risk effect. Limits for CDF and LERF are prescribed by procedure and are consistent with those limits given in NEI 04-10.

6.1.8 Non-PRA Modeled Hazards

The TVA process will use a qualitative process, and bounding analyses where appropriate, for assessing the risk impact of extending the surveillance frequency on SSCs for non-PRA modeled hazards, such as, other external hazards (e.g., high winds) and shutdown events. The TVA instruction for performing these assessments are aligned and consistent with the requirements of NEI 04-10.

7 CONCLUSION

The Browns Ferry PRA models (IE, IF, FPRA, and SPRA) are sufficiently robust and suitable for use in risk-informed processes such as the Owner Controlled SFCP. Peer reviews conducted on those models, and the endorsed F&O closure process demonstrate that the aspects of the PRA can adequately assess the change in risk associated changing surveillance test intervals consistent with the regulatory endorsed SFCP methodology described in NEI 00-04. Furthermore, non-PRA modeled hazards have been assessed against the current as-built, as-operated plant, and documented, and an acceptable methodology for assessing shutdown events is in place and well-implemented at Browns Ferry.

Additionally, TVA procedures are in-place that control the PRA maintenance and update process, and ensure the models represent the as-built, as-operated plant. The model is ‘living’ in terms that plant design changes and operational changes are assessed to determine if criteria are met that would require an off-schedule model update. Standard sensitivity studies consistent with the approved guidance document are performed on the

SSCs associated with the proposed STI that consider those open items. Application specific sensitivity studies are considered for any gaps specific to the requirements (hence, Capability Category I or Not Met) in the ASME/ANS PRA Standard.

The Browns Ferry Nuclear Power Plant PRA as described throughout this report is acceptable for use as an input for Risk-Informed Technical Specifications (RITS) Initiative 5b, Owner Controlled Surveillance Frequency Control Program.

7.1 Total Risk All Hazards

As shown in Table 16, the Total CDF and Total LERF from all hazards is below the maximum allowable from RG 1.174.

Table 16 Total CDF/LERF

Hazard	CDF/yr			LERF/yr		
	Unit 1	Unit 2	Unit 3	Unit 1	Unit 2	Unit 3
FPIE	4.07E-06	3.28E-06	5.99E-06	8.64E-07	7.95E-07	7.98E-07
FPRA	3.48E-05	4.25E-05	3.28E-05	5.44E-06	5.50E-06	4.52E-06
SPRA	6.30E-06	6.40E-06	7.13E-06	3.00E-06	3.10E-06	3.31E-06
Total	**4.52E-05**	**5.22E-05**	**4.59E-05**	**9.30E-06**	**9.40E-06**	**8.63E-06**
Acceptance Criteria*	<1.0E-04/yr			<1.0E-05/yr		

*The RG 1.174 acceptance criteria

Attachment 3.1 to CNL-20-003

Proposed Technical Specification Changes (Unit 1 Markup)
(114 total pages)

INSERT 1

In accordance with the Surveillance Frequency Control Program

INSERT 2

5.5.15 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	~~24 hours~~ Insert 1
SR 3.1.3.2	(Deleted).	
SR 3.1.3.3	-------------------------NOTE------------------------ Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. --- Insert each withdrawn control rod at least one notch.	~~31 days~~ Insert 1
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 06 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS

---NOTE---
During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown ≥ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	~~200 days cumulative operation in MODE 1~~

(continued)

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	~~24 hours~~
SR 3.1.7.2	Verify continuity of explosive charge.	~~31 days~~
SR 3.1.7.3	Verify the SPB concentration is ≥ 8.0% by weight.	~~31 days~~ AND Once within 24 hours after water or boron is added to solution
SR 3.1.7.4	Verify the SPB concentration is ≤ 9.2% by weight. OR	~~31 days~~ AND Once within 24 hours after water or boron is added to solution (continued)

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
	Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Once within 8 hours after discovery that SPB concentration is > 9.2% by weight AND 12 hours thereafter
SR 3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	~~31 days~~
SR 3.1.7.6	Verify the SLC conditions satisfy the following equation: $$\frac{(C)(Q)(E)}{(8.7\text{ wt.}\%)(50\text{ gpm})(94\text{ atom}\%)} \geq 1$$ where, C = sodium pentaborate solution concentration (weight percent) Q = pump flow rate (gpm) E = Boron-10 enrichment (atom percent Boron-10)	~~31 days~~ AND Once within 24 hours after water or boron is added to the solution
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	~~24 months~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	~~24 months~~
SR 3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	~~24 months~~ AND After addition to SLC tank
SR 3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	---------------------------NOTE--------------------------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. --- Verify each SDV vent and drain valve is open.	~~31 days~~ Insert 1
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	~~92 days~~ Insert 1
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP <u>AND</u> ~~24 hours thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 AND Once within 72 hours after each completion of SR 3.1.4.2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.1.1.2	-----NOTE----- Not required to be performed until 12 hours after THERMAL POWER $\geq$ 23% RTP. ----- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is $\leq$ 2% RTP while operating at $\geq$ 23% RTP.	~~7 days~~
SR 3.3.1.1.3	-----NOTE----- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ----- Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~
SR 3.3.1.1.5	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.6	----------NOTE---------- Only required to be met during entry into MODE 2 from MODE 1. ------------------- Verify the IRM and APRM channels overlap.	~~7 days~~
SR 3.3.1.1.7	Calibrate the local power range monitors.	~~1000 MWD/T average core exposure~~
SR 3.3.1.1.8	(Deleted) ~~Perform CHANNEL FUNCTIONAL TEST.~~	(continued) ~~92 days~~
SR 3.3.1.1.9	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ------------------- Perform CHANNEL CALIBRATION.	~~92 days~~

Insert 1

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	~~184 days~~
SR 3.3.1.1.11	(Deleted)	
SR 3.3.1.1.12	(Deleted) ~~Perform CHANNEL FUNCTIONAL TEST.~~	~~24 months~~
SR 3.3.1.1.13	------------------------NOTE------------------------ Neutron detectors are excluded. --- Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~
SR 3.3.1.1.15	Verify Turbine Stop Valve — Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure — Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	~~24 months~~
SR 3.3.1.1.16	------------------------NOTE------------------------ For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.1.1.17	(Deleted)	

Insert 1

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Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3(b)	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	≥18% (f)	3(b)	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16	NA
3. Reactor Vessel Steam Dome Pressure - High(d)	1,2	2	G	SR 3.3.1.1.1 SR ~~3.3.1.1.8~~ SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3(d)	1,2	2	G	SR 3.3.1.1.1 SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. High Drywell Pressure	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5(a)	2	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

3.3.1.1.4

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) Each APRM channel provides inputs to both trip systems.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.
The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

(f) Following Detect and Suppress Solution – Confirmation Density (DSS-CD) implementation, DSS-CD is not required to be armed while in the DSS-CD Armed Region during the first reactor startup and during the first controlled shutdown that passes completely through the DSS-CD Armed Region. However, DSS-CD is considered OPERABLE and shall be maintained OPERABLE and capable of automatically arming for operation at recirculation drive flow rates above the DSS-CD Armed Region.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High (continued)					
b. Float Switch	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
8. Turbine Stop Valve - Closure	≥ 26% RTP	4	E	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low(d)	≥ 26% RTP	2	E	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 550 psig
10. Reactor Mode Switch - Shutdown Position	1,2	1	G	SR ~~3.3.1.1.12~~ SR 3.3.1.1.14	NA
	5(a)	1	H	SR ~~3.3.1.1.12~~ SR 3.3.1.1.14	NA
11. Manual Scram	1,2	1	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.14	NA
	5(a)	1	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.14	NA
12. RPS Channel Test Switches	1,2	2	G	SR 3.3.1.1.4	NA
	5(a)	2	H	SR 3.3.1.1.4	NA

3.3.1.1.4

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified conditions.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.1.2.2	---NOTES--- 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. --- Verify an OPERABLE SRM detector is located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	~~12 hours~~ Insert 1
SR 3.3.1.2.3	~~Perform CHANNEL CHECK.~~ (Deleted)	~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.4	-----NOTE----- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. --------------- Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	12 hours during CORE ALTERATIONS AND ~~24 hours~~
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	~~7 days~~ Insert 1
SR 3.3.1.2.6	-----NOTE----- Not required to be performed until 12 hours after IRMs on Range 2 or below. --------------- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.7	------NOTES------ 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. ------ Perform CHANNEL CALIBRATION.	~~92 days~~ Insert 1

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2[(a)]	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR ~~3.3.1.2.3~~ 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2[(b)(c)]	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.2.1.2	---------------NOTE--------------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. ------------------------------------ Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.1.3	---------------NOTE--------------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. ------------------------------------ Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.1.4	---------------NOTE--------------- Neutron detectors are excluded. ------------------------------------ Perform CHANNEL CALIBRATION.	~~24 months~~

(continued)

(continued)

Insert 1

Move to new page

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	~~24 months~~
SR 3.3.2.1.6	---NOTE--- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. --- Perform CHANNEL FUNCTIONAL TEST.	~~24 months~~
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.8	---NOTE--- Neutron detectors are excluded. --- Verify the RBM: a. Low Power Range - Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range - Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤ 82% RTP. c. High Power Range - Upscale Function is not bypassed when THERMAL POWER is > 82% RTP.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained.

	SURVEILLANCE	FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	~~24 months~~
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	~~31 days~~
SR 3.3.3.1.2	(Deleted).	
SR 3.3.3.1.3	Perform CHANNEL CALIBRATION ~~of the Reactor Pressure Functions~~.	~~184 days~~
~~SR 3.3.3.1.4~~	~~Perform CHANNEL CALIBRATION for each required PAM instrumentation channel except for the Reactor Pressure Function.~~	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	~~24 months~~
SR 3.3.3.2.2	Perform CHANNEL CALIBRATION for ~~the Suppression Pool Water Level Function.~~ each required instrumentation channel	~~24 months~~ Insert 1
~~SR 3.3.3.2.3~~	~~Perform CHANNEL CALIBRATION for each required instrumentation channel except for the Suppression Pool Water Level Function.~~	~~24 months~~

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is $\geq$ 26% RTP.	~~24 months~~
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: $\leq$ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: $\geq$ 550 psig.	~~24 months~~ Insert 1
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~24 months~~

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	~~24 hours~~
SR 3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure - High: ≤ 1175 psig.	~~24 months~~ Insert 1
SR 3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~24 months~~

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c and 3.f; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

(Deleted)

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	~~92 days~~
SR 3.3.5.1.4	~~Perform CHANNEL CALIBRATION.~~	~~184 days~~
SR 3.3.5.1.5	~~Perform CHANNEL CALIBRATION.~~	~~24 months~~
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High(e)	1,2,3	4(b)	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)(e)	1,2,3	4(b) 2 per trip system	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig
d. Core Spray Pump Discharge Flow - Low (Bypass)	1,2,3	2 1 per subsystem	E	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~	≥ 1647 gpm and ≤ 2910 gpm
e. Core Spray Pump Start - Time Delay Relay					
Pumps A,B,C,D (with diesel power)	1,2,3	4 1 per pump	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump A (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds

3.3.5.1.3

(continued)

(a) Deleted.

(b) Channels affect Common Accident Signal Logic. Refer to LCO 3.8.1, "AC Sources - Operating."

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System (continued)					
e. Core Spray Pump Start - Time Delay Relay (continued)					
Pump C (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds
2. Low Pressure Coolant Injection (LPCI) System			3.3.5.1.3		
a. Reactor Vessel Water Level - Low Low Low, Level 1[e]	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High[e]	1,2,3	4	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)[e]	1,2,3	4	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig

(continued)

(a) Deleted.

(b) Deleted.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
d. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive)(e)	1(c), 2(c), 3(c)	4	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 215 psig and ≤ 245 psig
e. Reactor Vessel Water Level - Level 0	1,2,3	2 1 per subsystem	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 312 5/16 inches above vessel zero
f. Low Pressure Coolant Injection Pump Start - Time Delay Relay					
Pump A,B,C,D (with diesel power)	1,2,3	4	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump A (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump C (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds

3.3.5.1.3

(continued)

(a) Deleted.

(c) With associated recirculation pump discharge valve open.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low, Level 2(e)	1, 2(d), 3(d)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 470 inches above vessel zero
b. Drywell Pressure - High(e)	1, 2(d), 3(d)	4	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Vessel Water Level - High, Level 8	1, 2(d), 3(d)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 583 inches above vessel zero
d. Condensate Header Level - Low	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ Elev. 551 feet
e. Suppression Pool Water Level - High	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 7 inches above instrument zero
f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2(d), 3(d)	1	E	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 671 gpm
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero

3.3.5.1.3

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. ADS Trip System A (continued)					
b. Drywell Pressure - High(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 ~~SR 3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	~~SR 3.3.5.1.5~~ SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)(e)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 ~~SR 3.3.5.1.5~~ SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	~~SR 3.3.5.1.5~~ SR 3.3.5.1.6	≤ 322 seconds
5. ADS Trip System B					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 ~~SR 3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 ~~SR 3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig

$\boxed{3.3.5.1.3}$

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B (continued)					
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)(e)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 322 seconds

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1	Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Declare associated low pressure Emergency Core Cooling System (ECCS) injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---

Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 2 and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.6.1.3	~~Perform CHANNEL CALIBRATION.~~	~~92 days~~
SR 3.3.6.1.4	~~Perform CHANNEL CALIBRATION.~~	~~122 days~~
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

(Deleted)

Insert 1

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for performance of a CHANNEL CALIBRATION or maintenance, entry into associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the tripped condition.

	SURVEILLANCE	FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

-NOTES-

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each CREV Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CREV initiation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for the performance of a CHANNEL CALIBRATION or maintenance, entry into the associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the trip condition.

	SURVEILLANCE	FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	~~92 days~~
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~184 days~~
~~SR 3.3.7.1.5~~	~~Perform CHANNEL CALIBRATION.~~	~~24 months~~
~~SR 3.3.7.1.6~~	~~Perform LOGIC SYSTEM FUNCTIONAL TEST.~~	~~24 months~~

Insert 1

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Ventilation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≥ 528 inches above vessel zero
2. Drywell Pressure - High	1,2,3	2	B	SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≤ 2.5 psig
3. Reactor Zone Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≤ 100 mR/hr
4. Refueling Floor Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≤ 100 mR/hr
5. Control Room Air Supply Duct Radiation - High	1,2,3	1	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 270 cpm above background

SURVEILLANCE REQUIREMENTS

NOTE

Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CALIBRATION.	~~184 days~~
SR 3.3.8.1.2	~~Perform CHANNEL CALIBRATION.~~	~~12 months~~
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

(Deleted)

~~Shall be implemented before commencing Unit 2's Cycle 11 operation~~

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BOARD	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Shutdown Board Undervoltage (Loss of Voltage)			
a. Board Undervoltage	2	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	Reset at ≥ 2813 V and ≤ 2927 V
b. Diesel Start Initiation Time Delay	2	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 1.4 seconds and ≤ 1.6 seconds
2. 4.16 kV Shutdown Board Undervoltage (Degraded Voltage)	3.3.8.1.1		
a. Board Undervoltage	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3900 V and ≤ 3940 V
b.1 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 0.2 seconds and ≤ 0.4 seconds
b.2 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 3 seconds and ≤ 5 seconds
b.3 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 5.15 seconds and ≤ 8.65 seconds
b.4 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 0.9 seconds and ≤ 1.7 seconds
3. 4.16 kV Shutdown Board Undervoltage (Unbalanced Voltage Relay)	3	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≤ 1.5V at 3 seconds (Permissive Alarm) ≤ 3.4V at 8.65 seconds (Lo) ≤ 20V at 3.5 seconds (High)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	~~184 days~~
SR 3.3.8.2.3	Perform a system functional test.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	------------------------NOTE------------------------ Not required to be performed until 24 hours after both recirculation loops are in operation. -- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	~~24 hours~~ Insert 1

Double underline

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	-------------------------NOTES------------------------ 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 23% RTP. --	
	Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	-----------------------------NOTE----------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify each required S/RV opens when manually actuated.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	~~12 hours~~
SR 3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	~~31 days~~
SR 3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	~~184 days~~
SR 3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	-------------------NOTE------------------- Only required to be performed in MODE 1. --- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 3.2 μCi/gm.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.7.1	-------------------NOTE------------------- Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR low pressure permissive pressure. --- Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.9.1	-----NOTES----- 1. Only required to be performed during RCS heatup and cooldown operations or RCS inservice leak and hydrostatic testing when the vessel pressure is > 312 psig. 2. The limits of Figure 3.4.9-2 may be applied during nonnuclear heatup and ambient loss cooldown associated with inservice leak and hydrostatic testing provided that the heatup and cooldown rates are ≤ 15°F/hour. 3. The limits of Figures 3.4.9-1 and 3.4.9-2 do not apply when the tension from the reactor head flange bolting studs is removed. ---------- Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	Insert 1 ~~30 minutes~~
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-1, Curve No. 3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.9.5	-----NOTES----- 1. Only required to be performed when tensioning the reactor vessel head bolting studs. 2. The reactor vessel head bolts may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. ---------- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~30 minutes~~
SR 3.4.9.6	-----NOTE----- Not required to be performed until 30 minutes after RCS temperature ≤ 85°F in MODE 4. ---------- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~30 minutes~~
SR 3.4.9.7	-----NOTE----- Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. ---------- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.10.1	Verify reactor steam dome pressure is $\leq$ 1050 psig.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.1.2	-------------------------NOTE------------------------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. -- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	~~31 days~~
SR 3.5.1.4	Deleted.	

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	--------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.1.8	--------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~24 months~~
SR 3.5.1.9	--------------------------NOTE------------------------- Vessel injection/spray may be excluded. --- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	~~24 months~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.1.10	-------------------------NOTE------------------------ Valve actuation may be excluded. --- Verify the ADS actuates on an actual or simulated automatic initiation signal.	~~24 months~~ Insert 1
SR 3.5.1.11	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each ADS valve opens when manually actuated.	~~24 months~~ Insert 1
SR 3.5.1.12	(Deleted).	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	~~12 hours~~ Insert 1
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	~~12 hours~~ Insert 1
SR 3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~ Insert 1
SR 3.5.2.4	Verify for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	~~92 days~~ Insert 1
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal. (continued)	~~24 months~~ Insert 1
SR 3.5.2.7	------------------------------NOTE------------------------------ Vessel injection/spray may be excluded. -- Verify the required ECCS injection/spray subsystem can be manually operated.	~~24 months~~ Insert 1

Move to new page

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.3.3	------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.3.4	------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~24 months~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	-------------------------NOTE------------------------ Vessel injection may be excluded. --- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	Insert 1 ~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute over a 10 minute period at an initial differential pressure of 1 psid.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.1	------------------NOTES------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. --- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.3.1	-----NOTE----- Not required to be met when the 18 and 20 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. --------------- Verify each 18 and 20 inch primary containment purge valve is closed.	~~31 days~~
SR 3.6.1.3.2	-----NOTES----- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for instrument panel valves, vent and drain valves, leak-off lines, and test connection valves. --------------- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	~~31 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.1.3.3	------NOTES------ 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for vent and drain valves, leak-off lines, and test connection valves. ------------------ Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	~~24 months~~
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	~~24 months~~ Insert 1
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.4.1	Verify drywell average air temperature is within limit.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.5.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. -- Verify each vacuum breaker is closed.	~~14 days~~
SR 3.6.1.5.2	Perform a functional test of each vacuum breaker.	~~92 days~~
SR 3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is ≤ 0.5 psid.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. --- Verify each vacuum breaker is closed.	~~14 days~~
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	~~24 hours~~ Insert 1 AND 5 minutes when performing testing that adds heat to the suppression pool

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	~~5 years~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~
SR 3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	~~5 years~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1.1	Verify ≥ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	~~31 days~~
SR 3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	~~31 days~~
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	~~31 days~~ Insert 1
SR 3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 120 seconds.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.4.1.4	Verify two SGT subsystems can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate ≤ 12,000 cfm.	~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	~~92 days~~ Insert 1
SR 3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~

~~-shall be implemented before commencing Unit 2's cycle 11 opera~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	~~31 days~~
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	~~24 months~~
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	~~12 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	~~24 hours~~ Insert 1
SR 3.7.2.2	-------------------NOTE------------------- Isolation of flow to individual components does not render EECW System inoperable. -- Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	~~24 months~~

~~– shall be implemented before commencing Unit 2's Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	~~31 days~~
SR 3.7.3.2	Perform required CREV filter testing in accordance with the VFTP.	In accordance with the VFTP
SR 3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	~~24 months~~
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	~~24 months~~ Insert 1

~~– Shall be implemented before commencing Unit 2's Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	~~31 days~~
SR 3.7.5.2	Perform a system functional test.	~~24 months~~
SR 3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the spent fuel storage pool water level is ≥ 21.5 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTE-----------------------------------
SR 3.8.1.1 through SR 3.8.1.9 are applicable to the Unit 1 and 2 AC sources.
SR 3.8.1.10 is applicable only to Unit 3 AC sources.

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	---------------NOTES--------------- 1. Performance of SR 3.8.1.4 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.4 must be met. -- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	Insert 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	-------------------NOTES------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.1 or SR 3.8.1.4. --- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2295 kW and ≤ 2550 kW.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	~~31 days~~
SR 3.8.1.4	-----NOTE----- All DG starts may be preceded by an engine prelube period. Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3940 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.5	——NOTE—— If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. ——— Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; and b. Following load rejection, the steady state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	~~24 months~~
SR 3.8.1.6	——NOTE—— All DG starts may be preceded by an engine prelube period followed by a warmup period. ——— Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	~~24 months~~

Insert 1

(continued)

~~-Shall be implemented before commencing Unit 2's Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	NOTE Momentary transients outside the load and power factor ranges do not invalidate this test. Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2680 kW and ≤ 2805 kW; and b. For the remaining hours of the test loaded ≥ 2295 kW and ≤ 2550 kW.	~~24 months~~
SR 3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	~~24 months~~

Insert 1

(continued)

~~- shall be implemented before commencing Unit 2's Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	------NOTE------ All DG starts may be preceded by an engine prelube period. ------ Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~24 months~~ Insert 1
SR 3.8.1.10	For required Unit 3 DGs, the SRs of Unit 3 Technical Specifications are applicable.	In accordance with applicable SRs

~~Shall be implemented before commencing Unit 2's Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply.	~~31 days~~
SR 3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	~~31 days~~
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required DG air start receiver unit pressure is ≥ 165 psig.	~~31 days~~
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	~~7 days~~
SR 3.8.4.2	-------------------NOTE------------------- Performance of SR 3.8.4.5 satisfies this SR. -- Verify each required battery charger charges its respective battery after the battery's ~~24 month~~ service test.	~~24 months~~ Insert 1
SR 3.8.4.3	-------------------NOTE------------------- The modified performance discharge test in SR 3.8.4.4 may be performed in lieu of the service test in SR 3.8.4.3 ~~once per 60 months~~. -- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~24 months~~

(continued)

~~- shall be implemented before commencing unit 2's Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~60 months~~ Insert 1 AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of expected life with capacity ≥ 100% of manufacturer's rating
SR 3.8.4.5	-----NOTE----- Credit may be taken for unplanned events that satisfy this SR. Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	~~60 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	~~7 days~~
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	~~92 days~~ Insert 1
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for each Unit and Shutdown Board battery (except Shutdown Board battery 3EB), and ≥ 40°F for Shutdown Board battery 3EB and each DG battery.	~~92 days~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in refuel position.	~~12 hours~~
SR 3.9.2.2	-------------------NOTE------------------- Not required to be performed until 1 hour after any control rod is withdrawn. --	Insert 1
	Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.5.1	-----NOTE----- Not required to be performed until 7 days after the control rod is withdrawn. ----- Insert each withdrawn control rod at least one notch.	~~7 days~~ Insert 1
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	~~12 hours~~ Insert 1
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.3.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.3.2	------NOTE------ Not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements. ------------ Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	-------------------NOTE------------------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. --- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~24 hours~~ Insert 1
SR 3.10.4.4	-------------------NOTE------------------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. --- Verify a control rod withdrawal block is inserted.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	~~24 hours~~
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	~~24 hours~~
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	~~24 hours~~
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	~~24 hours~~
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	~~24 hours~~
SR 3.10.6.3	------------------NOTE------------------ *Only required to be met during fuel loading.* -- Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d, and 2 e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.8.2	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.3 satisfied. --- Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 2 of Table 3.3.2.1-1.	According to the applicable SRs
SR 3.10.8.3	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.2 satisfied. --- Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.	During control rod movement
SR 3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	~~12 hours~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.8.5	Verify each withdrawn control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position AND Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.8.6	Verify CRD charging water header pressure ≥ 940 psig.	~~7 days~~ Insert 1

5.5 Programs and Manuals

5.5.14 Residual Heat Removal (RHR) Heat Exchanger Performance Monitoring Program

This program is established to ensure that the RHR heat exchangers are maintained in a condition that meets or exceeds the minimum performance capability assumed in containment analyses, which support not taking credit for containment accident pressure in the NPSH analyses. The RHR heat exchanger testing and determination of overall uncertainty in the fouling resistance shall be in accordance with the guidelines in EPRI report, EPRI 3002005340, Service Water Heat Exchanger Test Guidelines, May 2015. This program establishes the following attributes.

a. The program establishes provisions to periodically monitor RHR heat exchanger thermal performance. The program includes frequency of monitoring and the methodology considers uncertainty of the result.

b. The program establishes and controls acceptance criteria for RHR heat exchanger worst fouling resistance and number of plugged tubes.

c. The program establishes limitations and allows for compensatory actions if degraded performance is observed.

d. Changes to the program shall be made under appropriate administrative review.

e. Details of the program including program limitations, compensatory actions for degraded performance, testing method, data acquisition method, data reduction method, overall uncertainty determination method, thermal performance analysis, acceptance criteria, and computer programs used that meet the 10 CFR 50 Appendix B, and 10 CFR 21 requirements are described in the UFSAR.

Insert 2

Insert new page

Attachment 3.2 to CNL-20-003

Proposed Technical Specification Changes (Unit 2 Markup)
(114 total pages)

INSERT 1

In accordance with the Surveillance Frequency Control Program

INSERT 2

5.5.15 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	~~24 hours~~ Insert 1
SR 3.1.3.2	(Deleted).	
SR 3.1.3.3	---NOTE--- Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. ------ Insert each withdrawn control rod at least one notch.	~~31 days~~ Insert 1
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 06 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS

---NOTE---
During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown ≥ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	~~200 days cumulative operation in MODE 1~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	~~24 hours~~
SR 3.1.7.2	Verify continuity of explosive charge.	~~31 days~~
SR 3.1.7.3	Verify the SPB concentration is ≥ 8.0% by weight.	~~31 days~~ AND Once within 24 hours after water or boron is added to solution
SR 3.1.7.4	Verify the SPB concentration is ≤ 9.2% by weight. OR	~~31 days~~ AND Once within 24 hours after water or boron is added to solution (continued)

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
	Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Once within 8 hours after discovery that SPB concentration is > 9.2% by weight AND 12 hours thereafter
SR 3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	~~31 days~~
SR 3.1.7.6	Verify the SLC conditions satisfy the following equation: $\frac{(C)(Q)(E)}{(8.7\text{ wt. }\%)(50\text{ gpm})(94\text{ atom}\%)} \geq 1$ where, C = sodium pentaborate solution concentration (weight percent) Q = pump flow rate (gpm) E = Boron-10 enrichment (atom percent Boron-10)	~~31 days~~ AND Once within 24 hours after water or boron is added to the solution
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	~~24 months~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	~~24 months~~
SR 3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	~~24 months~~ AND After addition to SLC tank
SR 3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	----------NOTE---------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. Verify each SDV vent and drain valve is open.	~~31 days~~
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	~~92 days~~ Insert 1
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	~~24 months~~

~~-shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 AND Once within 72 hours after each completion of SR 3.1.4.2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.1.1.2	--------------------------NOTE-------------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. --- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	~~7 days~~
SR 3.3.1.1.3	--------------------------NOTE-------------------------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~
SR 3.3.1.1.5	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.6	-----NOTE----- Only required to be met during entry into MODE 2 from MODE 1. ----- Verify the IRM and APRM channels overlap.	~~7 days~~
SR 3.3.1.1.7	Calibrate the local power range monitors.	~~1000 MWD/T average core exposure~~
SR 3.3.1.1.8 (Deleted)	~~Perform CHANNEL FUNCTIONAL TEST.~~	~~92 days~~
SR 3.3.1.1.9	-----NOTES----- 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ----- Perform CHANNEL CALIBRATION.	~~92 days~~

Insert 1

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	~~184 days~~ Insert 1
SR 3.3.1.1.11	(Deleted).	
SR 3.3.1.1.12	~~Perform CHANNEL FUNCTIONAL TEST.~~ (Deleted)	~~24 months~~
SR 3.3.1.1.13	-------------------------NOTE------------------------- Neutron detectors are excluded. -- Perform CHANNEL CALIBRATION.	~~24 months~~ Insert 1
SR 3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~ Insert 1
SR 3.3.1.1.15	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	~~24 months~~ Insert 1
(continued)		
SR 3.3.1.1.16	-------------------------NOTE------------------------- For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~ Insert 1
SR 3.3.1.1.17	(Deleted).	

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Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3(b)	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	$\geq$18%(f)	3(b)	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16	NA
3. Reactor Vessel Steam Dome Pressure - High(d)	1,2	2	G	SR 3.3.1.1.1 SR ~~3.3.1.1.8~~ SR 3.3.1.1.10 SR 3.3.1.1.14	$\leq$ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3(d)	1,2	2	G	SR 3.3.1.1.1 SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	$\geq$ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	$\leq$ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	$\leq$ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	$\leq$ 50 gallons
	5(a)	2	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	$\leq$ 50 gallons

2.2.1.1.4

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.
(b) Each APRM channel provides inputs to both trip systems.
(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.
The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.
(f) Following Detect and Suppress Solution – Confirmation Density (DSS-CD) implementation, DSS-CD is not required to be armed while in the DSS-CD Armed Region during the first reactor startup and during the first controlled shutdown that passes completely through the DSS-CD Armed Region. However, DSS-CD is considered OPERABLE and shall be maintained OPERABLE and capable of automatically arming for operation at recirculation drive flow rates above the DSS-CD Armed Region.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High (continued)					
b. Float Switch	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
8. Turbine Stop Valve - Closure	≥ 26% RTP	4	E	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low(d)	≥ 26% RTP	2	E	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 550 psig
10. Reactor Mode Switch - Shutdown Position	1,2	1	G	SR ~~3.3.1.1.12~~ SR 3.3.1.1.14	NA
	5(a)	1	H	SR ~~3.3.1.1.12~~ SR 3.3.1.1.14	NA
11. Manual Scram	1,2	1	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.14	NA
	5(a)	1	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.14	NA
12. RPS Channel Test Switches	1,2	2	G	SR 3.3.1.1.4	NA
	5(a)	2	H	SR 3.3.1.1.4	NA
13. Deleted					

3.3.1.1.4

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified conditions.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.1.2.2	---NOTES--- 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. --- Verify an OPERABLE SRM detector is located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	~~12 hours~~ Insert 1
SR 3.3.1.2.3	~~Perform CHANNEL CHECK.~~ (Deleted)	~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2.4	-----NOTE----- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. --- Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	12 hours during CORE ALTERATIONS AND ~~24 hours~~
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	~~7 days~~
SR 3.3.1.2.6	-----NOTE----- Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	~~31 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.7	-------------------NOTES------------------- 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL CALIBRATION.	~~92 days~~ Insert 1

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2(a)	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR ~~3.3.1.2.3~~ 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2(b)(c)	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

SURVEILLANCE REQUIREMENTS

-NOTES-

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.2.1.2	-NOTE- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2.	
	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.1.3	-NOTE- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1.	
	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.1.4	-NOTE- Neutron detectors are excluded.	
	Perform CHANNEL CALIBRATION.	~~24 months~~

(continued)

Insert 1

(continued

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~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	~~24 months~~
SR 3.3.2.1.6	---NOTE--- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. --- Perform CHANNEL FUNCTIONAL TEST.	~~24 months~~
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.8	---NOTE--- Neutron detectors are excluded. --- Verify the RBM: a. Low Power Range – Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range – Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤ 82% RTP. c. High Power Range – Upscale Function is not bypassed when THERMAL POWER is > 82% RTP.	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

NOTE

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	~~24 months~~
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	~~31 days~~
SR 3.3.3.1.2	(Deleted)	
SR 3.3.3.1.3	Perform CHANNEL CALIBRATION ~~of the Reactor Pressure Functions~~.	~~184 days~~ Insert 1
~~SR 3.3.3.1.4~~	~~Perform CHANNEL CALIBRATION for each required PAM instrumentation channel except for the Reactor Pressure Function.~~	~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	~~24 months~~
SR 3.3.3.2.2	Perform CHANNEL CALIBRATION for ~~the Suppression Pool Water Level Function.~~ each required instrumentation channel	~~184 days~~ Insert 1
~~SR 3.3.3.2.3~~	~~Perform CHANNEL CALIBRATION for each required instrumentation channel except for the Suppression Pool Water Level Function.~~	~~24 months~~

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

---NOTE---
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~ Insert 1
SR 3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is $\geq$ 26% RTP.	~~24 months~~ Insert 1
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: $\leq$ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: $\geq$ 550 psig.	~~24 months~~ Insert 1
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

NOTE

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	~~24 hours~~
SR 3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure - High: ≤ 1175 psig.	~~24 months~~ Insert 1
SR 3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~24 months~~

~~Shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c and 3.f; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	~~92 days~~
~~SR 3.3.5.1.4~~	~~Perform CHANNEL CALIBRATION.~~	~~184 days~~
SR 3.3.5.1.5	~~Perform CHANNEL CALIBRATION.~~	~~24 months~~
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

(Deleted)

~~shall be implemented before commencing Cycle 11 operation~~

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level - Low Low Low, Level 1[e]	1,2,3	4[b]	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High[e]	1,2,3	4[b]	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)[e]	1,2,3	4[b] 2 per trip system	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig
			3.3.5.1.3		
d. Core Spray Pump Discharge Flow - Low (Bypass)	1,2,3	2 1 per subsystem	E	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~	≥ 1647 gpm and ≤ 2910 gpm
e. Core Spray Pump Start - Time Delay Relay					
Pumps A,B,C,D (with diesel power)	1,2,3	4 1 per pump	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump A (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds

(continued)

(a) Deleted.

(b) Channels affect Common Accident Signal Logic. Refer to LCO 3.8.1, "AC Sources - Operating."

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System (continued)					
e. Core Spray Pump Start - Time Delay Relay (continued)					
Pump C (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds
2. Low Pressure Coolant Injection (LPCI) System			3.3.5.1.3		
a. Reactor Vessel Water Level - Low Low Low, Level 1[e]	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High[e]	1,2,3	4	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)[e]	1,2,3	4	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig

(continued)

(a) Deleted.

(b) Deleted.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
d. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive)(e)	1(c), 2(c), 3(c)	4	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 215 psig and ≤ 245 psig
e. Reactor Vessel Water Level - Level 0	1,2,3	2 1 per subsystem	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 312 5/16 inches above vessel zero
f. Low Pressure Coolant Injection Pump Start - Time Delay Relay					
Pump A,B,C,D (with diesel power)	1,2,3	4	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump A (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump C (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds

$\boxed{3.3.5.1.3}$

(continued)

(a) Deleted.

(c) With associated recirculation pump discharge valve open.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low, Level 2(e)	1, 2(d), 3(d)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 470 inches above vessel zero
b. Drywell Pressure - High(e)	1, 2(d),3(d)	4	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Vessel Water Level - High, Level 8	1, 2(d), 3(d)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 583 inches above vessel zero
d. Condensate Header Level - Low	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ Elev. 551 feet
e. Suppression Pool Water Level - High	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 7 inches above instrument zero
f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2(d), 3(d)	1	E	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 671 gpm
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero

3.3.5.1.3

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. ADS Trip System A (continued)					
b. Drywell Pressure - High(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)(e)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 322 seconds
5. ADS Trip System B					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero

3.3.5.1.3

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B (continued)					
b. Drywell Pressure - High(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory) (e)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 322 seconds

3.3.5.1.3

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1 Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated low pressure Emergency Core Cooling System (ECCS) injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 2 and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	~~24 hours~~ Insert 1
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~ Insert 1
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	~~24 months~~ Insert 1
SR 3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.6.1.3	~~Perform CHANNEL CALIBRATION.~~	~~92 days~~
SR 3.3.6.1.4	~~Perform CHANNEL CALIBRATION.~~	~~122 days~~
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

(Deleted)

Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability.
3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for performance of a CHANNEL CALIBRATION or maintenance, entry into associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the tripped condition.

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

~~shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each CREV Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CREV initiation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for the performance of a CHANNEL CALIBRATION or maintenance, entry into the associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the trip condition.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	~~92 days~~
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~184 days~~
~~SR 3.3.7.1.5~~	~~Perform CHANNEL CALIBRATION.~~	~~24 months~~
~~SR 3.3.7.1.6~~	~~Perform LOGIC SYSTEM FUNCTIONAL TEST.~~	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Ventilation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ SR ~~3.3.7.1.6~~	≥ 528 inches above vessel zero
2. Drywell Pressure - High	1,2,3	2	B	SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ SR ~~3.3.7.1.6~~	≤ 2.5 psig
3. Reactor Zone Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ SR ~~3.3.7.1.6~~	≤ 100 mR/hr
4. Refueling Floor Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ SR ~~3.3.7.1.6~~	≤ 100 mR/hr
5. Control Room Air Supply Duct Radiation - High	1,2,3	1	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 270 cpm above background

3.3.7.1.3

3.3.7.1.4

SURVEILLANCE REQUIREMENTS

-NOTE-
Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CALIBRATION.	~~184 days~~
SR 3.3.8.1.2	~~Perform CHANNEL CALIBRATION.~~	~~12 months~~
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

(Deleted)

~~shall be implemented before commencing Cycle 11 operation~~

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BOARD	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Shutdown Board Undervoltage (Loss of Voltage)			
a. Board Undervoltage	2	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	Reset at ≥ 2813 V and ≤ 2927 V
b. Diesel Start Initiation Time Delay	2	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 1.4 seconds and ≤ 1.6 seconds
2. 4.16 kV Shutdown Board Undervoltage (Degraded Voltage)	3.3.8.1.1		
a. Board Undervoltage	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3900 V and ≤ 3940 V
b.1 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 0.2 seconds and ≤ 0.4 seconds
b.2 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 3 seconds and ≤ 5 seconds
b.3 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 5.15 seconds and ≤ 8.65 seconds
b.4 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 0.9 seconds and ≤ 1.7 seconds
3. 4.16 kV Shutdown Board Undervoltage (Unbalanced Voltage Relay)	3	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≤ 1.5V at 3 seconds (Permissive Alarm) ≤ 3.4V at 8.65 seconds (Lo) ≤ 20V at 3.5 seconds (High)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	~~184 days~~
SR 3.3.8.2.3	Perform a system functional test.	~~24 months~~

Insert 1

~~shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	-------------------NOTE------------------- Not required to be performed until 24 hours after both recirculation loops are in operation. --	
	Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	~~24 hours~~ Insert 1

Double underline

and effective ~~shall be implemented at the end of the Unit 2 cycle 10 outage schedule to begin on April 11, 1999~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.2.1	-----------------------------NOTES----------------------- 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 23% RTP. --- Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -------------------- Verify each required S/RV opens when manually actuated.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	~~12 hours~~
SR 3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	~~31 days~~
SR 3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	~~184 days~~
SR 3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	-----NOTE----- Only required to be performed in MODE 1.	
	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 3.2 µCi/gm.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	-------------------NOTE------------------- Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR low pressure permissive pressure. --- Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	-------------------------NOTES----------------------- 1. Only required to be performed during RCS heatup and cooldown operations or RCS inservice leak and hydrostatic testing when the vessel pressure is > 313 psig. 2. The limits of Figure 3.4.9-2 may be applied during nonnuclear heatup and ambient loss cooldown associated with inservice leak and hydrostatic testing provided that the heatup and cooldown rates are ≤ 15°F/hour. 3. The limits of Figures 3.4.9-1 and 3.4.9-2 do not apply when the tension from the reactor head flange bolting studs is removed. --- Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	Insert 1 ~~30 minutes~~
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-1, Curve No. 3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.9.5	---NOTES--- 1. Only required to be performed when tensioning the reactor vessel head bolting studs. 2. The reactor vessel head bolts may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~30 minutes~~
SR 3.4.9.6	---NOTE--- Not required to be performed until 30 minutes after RCS temperature ≤ 85°F in MODE 4. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~30 minutes~~
SR 3.4.9.7	---NOTE--- Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.10.1	Verify reactor steam dome pressure is ≤ 1050 psig.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~ Insert 1
SR 3.5.1.2	-------------------NOTE------------------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. -- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	~~31 days~~
SR 3.5.1.4	Verify the LPCI cross tie valve is closed and power is removed from the valve operator.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	-----NOTE----- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.1.8	-----NOTE----- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~24 months~~
SR 3.5.1.9	-----NOTE----- Vessel injection/spray may be excluded. Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	~~24 months~~

Insert 1

(continued)

~~shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.10	-----NOTE----- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	~~24 months~~
SR 3.5.1.11	-----NOTE----- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each ADS valve opens when manually actuated.	~~24 months~~
SR 3.5.1.12	(Deleted)	

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	~~12 hours~~
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	~~12 hours~~
SR 3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.2.4	Verify for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	~~92 days~~
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	~~24 months~~
SR 3.5.2.7	------------------------------NOTE------------------------------ Vessel injection/spray may be excluded. -- Verify the required ECCS injection/spray subsystem can be manually operated.	~~24 months~~

Insert 1

(continued)

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.3.3	-------------------NOTE------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.	
	Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.3.4	-------------------NOTE------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.	
	Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~24 months~~

Insert 1

(continued)

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	------------------NOTE------------------ Vessel injection may be excluded. --- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	~~24 months~~ Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute over a 10 minute period at an initial differential pressure of 1 psid.	~~24 months~~ Insert 1

~~-shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.2.1	-----NOTES----- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. ----- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.3.1	------------------NOTE------------------ Not required to be met when the 18 and 20 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. --- Verify each 18 and 20 inch primary containment purge valve is closed.	~~31 days~~ Insert 1
SR 3.6.1.3.2	------------------NOTES------------------ 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for instrument panel valves, vent and drain valves, leak-off lines, and test connection valves. --- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.3	---NOTES--- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for vent and drain valves, leak-off lines, and test connection valves. --- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is $\geq$ 3 seconds and $\leq$ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	~~24 months~~
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	~~24 months~~
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.1.3.10	Verify leakage rate through each MSIV is $\leq$ 100 scfh and that the combined leakage rate for all four main steam lines is $\leq$ 150 scfh when tested at $\geq$ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.4.1	Verify drywell average air temperature is within limit.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	NOTES 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. Verify each vacuum breaker is closed.	~~14 days~~ Insert 1
SR 3.6.1.5.2	Perform a functional test of each vacuum breaker.	~~92 days~~ Insert 1
SR 3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is $\leq$ 0.5 psid.	~~24 months~~ Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.6.1	------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. -- Verify each vacuum breaker is closed.	~~14 days~~ Insert 1
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is $\leq$ 0.5 psid.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	~~24 hours~~ Insert 1 AND 5 minutes when performing testing that adds heat to the suppression pool

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	~~5 years~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	~~5 years~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1.1	Verify ≥ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	~~31 days~~
SR 3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	~~31 days~~
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	~~31 days~~ Insert 1
SR 3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 120 seconds.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.4.1.4	Verify two SGT subsystems can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate ≤ 12,000 cfm.	~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	~~92 days~~
SR 3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	~~31 days~~
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	~~24 months~~
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	~~12 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1

Delete row

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	~~24 hours~~
SR 3.7.2.2	-------------------------NOTE------------------------- Isolation of flow to individual components does not render EECW System inoperable. --- Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	~~31 days~~
SR 3.7.3.2	Perform required CREV filter testing in accordance with the VFTP.	In accordance with the VFTP
SR 3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	~~24 months~~
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	~~24 months~~

Insert 1

~~shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	~~31 days~~
SR 3.7.5.2	Perform a system functional test.	~~24 months~~
SR 3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	~~24 months~~

Insert 1

~~- shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the spent fuel storage pool water level is ≥ 21.5 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

NOTE

SR 3.8.1.1 through SR 3.8.1.9 are applicable to the Unit 1 and 2 AC sources.
SR 3.8.1.10 is applicable only to Unit 3 AC sources.

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	NOTES 1. Performance of SR 3.8.1.4 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.4 must be met. Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	------------------NOTES------------------ 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.1 or SR 3.8.1.4. -- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2295 kW and ≤ 2550 kW.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	~~31 days~~
SR 3.8.1.4	-NOTE- All DG starts may be preceded by an engine prelube period. Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3940 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.5	NOTE If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; and b. Following load rejection, the steady state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	~~24 months~~
SR 3.8.1.6	NOTE All DG starts may be preceded by an engine prelube period followed by a warmup period. Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	~~24 months~~

Insert 1

(continued)

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	----------NOTE---------- Momentary transients outside the load and power factor ranges do not invalidate this test. ------------------------------ Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2680 kW and ≤ 2805 kW; and b. For the remaining hours of the test loaded ≥ 2295 kW and ≤ 2550 kW.	~~24 months~~ Insert 1
SR 3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	~~24 months~~

(continued)

~~shall be implemented before commencing Cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	---NOTE--- All DG starts may be preceded by an engine prelube period. ------ Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~24 months~~ Insert 1
SR 3.8.1.10	For required Unit 3 DGs, the SRs of Unit 3 Technical Specifications are applicable.	In accordance with applicable SRs

~~shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply of fuel.	~~31 days~~
SR 3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	~~31 days~~
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required DG air start receiver unit pressure is ≥ 165 psig.	~~31 days~~
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	~~7 days~~
SR 3.8.4.2	-------------------NOTE------------------- Performance of SR 3.8.4.5 satisfies this SR.	
	Verify each required battery charger charges its respective battery after the battery's ~~24 month~~ service test.	~~24 months~~
SR 3.8.4.3	-------------------NOTE------------------- The modified performance discharge test in SR 3.8.4.4 may be performed in lieu of the service test in SR 3.8.4.3 ~~once per 60 months~~.	
	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~24 months~~

Insert 1

(continued)

~~shall be implemented before commencing cycle 11 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~60 months~~ AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of expected life with capacity ≥ 100% of manufacturer's rating
SR 3.8.4.5	-------------------NOTE------------------- Credit may be taken for unplanned events that satisfy this SR. -- Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	~~60 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	~~7 days~~
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	~~92 days~~
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for each Unit and Shutdown Board battery (except Shutdown Board battery 3EB), and ≥ 40°F for Shutdown Board battery 3EB and each DG battery.	~~92 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in refuel position.	~~12 hours~~
SR 3.9.2.2	-----NOTE----- Not required to be performed until 1 hour after any control rod is withdrawn. ---------- Perform CHANNEL FUNCTIONAL TEST.	7 days

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.5.1	-------------------NOTE------------------- Not required to be performed until 7 days after the control rod is withdrawn. -- Insert each withdrawn control rod at least one notch.	~~7 days~~ Insert 1
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	~~12 hours~~ Insert 1
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.3.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.3.2	-----NOTE----- Not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements. ----- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~ Insert 1
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	------------------NOTE------------------ Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. -- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~24 hours~~ Insert 1
SR 3.10.4.4	------------------NOTE------------------ Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. -- Verify a control rod withdrawal block is inserted.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	~~24 hours~~
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	~~24 hours~~
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	~~24 hours~~
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	~~24 hours~~
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	~~24 hours~~ Insert 1
SR 3.10.6.3	-----NOTE----- Only required to be met during fuel loading. Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d and 2.e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.8.2	-------------------NOTE------------------- Not required to be met if SR 3.10.8.3 satisfied. --- Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 2 of Table 3.3.2.1-1.	According to the applicable SRs
SR 3.10.8.3	-------------------NOTE------------------- Not required to be met if SR 3.10.8.2 satisfied. --- Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.	During control rod movement
SR 3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	~~12 hours~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.8.5	Verify each withdrawn control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position AND Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.8.6	Verify CRD charging water header pressure ≥ 940 psig.	~~7 days~~ Insert 1

5.5 Programs and Manuals

5.5.14 Residual Heat Removal (RHR) Heat Exchange Performance Monitoring Program

This program is established to ensure that the RHR heat exchangers are maintained in a condition that meets or exceeds the minimum performance capability assumed in containment analyses, which support not taking credit for containment accident pressure in the NPSH analyses. The RHR heat exchanger testing and determination of overall uncertainty in the fouling resistance shall be in accordance with the guidelines in EPRI report, EPRI 3002005340, Service Water Heat Exchanger Test Guidelines, May 2015. This program establishes the following attributes.

a. The program establishes provisions to periodically monitor RHR heat exchanger thermal performance. The program includes frequency of monitoring and the methodology considers uncertainty of the result.

b. The program establishes and controls acceptance criteria for RHR heat exchanger worst fouling resistance and number of plugged tubes.

c. The program establishes limitations and allows for compensatory actions if degraded performance is observed.

d. Changes to the program shall be made under appropriate administrative review.

e. Details of the program including program limitations, compensatory actions for degraded performance, testing method, data acquisition method, data reduction method, overall uncertainty determination method, thermal performance analysis, acceptance criteria, and computer programs used that meet the 10 CFR 50 Appendix B, and 10 CFR 21 requirements are described in the UFSAR.

Insert 2

Insert new page

Attachment 3.3 to CNL-20-003

Proposed Technical Specification Changes (Unit 3 Markup)
(114 total pages)

INSERT 1

In accordance with the Surveillance Frequency Control Program

INSERT 2

5.5.15 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	~~24 hours~~
SR 3.1.3.2	(Deleted).	
SR 3.1.3.3	-------------------------NOTE------------------------ Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. --- Insert each withdrawn control rod at least one notch.	Insert 1 ~~31 days~~
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 06 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS

-----NOTE-----
During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown ≥ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	~~200 days cumulative operation in MODE 1~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	~~24 hours~~
SR 3.1.7.2	Verify continuity of explosive charge.	~~31 days~~
SR 3.1.7.3	Verify the SPB concentration is ≥ 8.0% by weight.	~~31 days~~ AND Once within 24 hours after water or boron is added to solution
SR 3.1.7.4	Verify the SPB concentration is ≤ 9.2% by weight. OR	~~31 days~~ AND Once within 24 hours after water or boron is added to solution (continued)

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
	Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Once within 8 hours after discovery that SPB concentration is > 9.2% by weight AND 12 hours thereafter
SR 3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	~~31 days~~
SR 3.1.7.6	Verify the SLC conditions satisfy the following equation: $\frac{(C)(Q)(E)}{(8.7\text{ wt. \%})(50\text{ gpm})(94\text{ atom\%})} \geq 1$ where, C = sodium pentaborate solution concentration (weight percent) Q = pump flow rate (gpm) E = Boron-10 enrichment (atom percent Boron-10)	~~31 days~~ AND Once within 24 hours after water or boron is added to the solution
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	~~24 months~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	~~24 months~~
SR 3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	~~24 months~~ AND After addition to SLC tank
SR 3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	-------------------NOTE------------------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. -- Verify each SDV vent and drain valve is open.	~~31 days~~
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	~~92 days~~
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 AND Once within 72 hours after each completion of SR 3.1.4.2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND ~~24 hours thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.1.1.2	-------------------------NOTE------------------------ Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. --- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	~~7 days~~
SR 3.3.1.1.3	-------------------------NOTE------------------------ Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~
SR 3.3.1.1.5	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.6	-----NOTE----- Only required to be met during entry into MODE 2 from MODE 1. ----- Verify the IRM and APRM channels overlap.	~~7 days~~
SR 3.3.1.1.7	Calibrate the local power range monitors.	~~1000 MWD/T average core exposure~~
SR 3.3.1.1.8	(Deleted) ~~Perform CHANNEL FUNCTIONAL TEST.~~	~~92 days~~
SR 3.3.1.1.9	-----NOTES----- 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ----- Perform CHANNEL CALIBRATION.	~~92 days~~

Insert 1

(continued)

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	~~184 days~~
SR 3.3.1.1.11	(Deleted)	
SR 3.3.1.1.12	(Deleted) ~~Perform CHANNEL FUNCTIONAL TEST.~~	~~24 months~~
SR 3.3.1.1.13	----------NOTE---------- Neutron detectors are excluded. ---------- Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~
SR 3.3.1.1.15	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	~~24 months~~
SR 3.3.1.1.16	----------NOTE---------- For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.1.1.17	(Deleted)	

Insert 1

(continued)

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Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3(b)	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	≥18%(f)	3(b)	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16	NA
3. Reactor Vessel Steam Dome Pressure - High(d)	1,2	2	G	SR 3.3.1.1.1 SR ~~3.3.1.1.8~~ SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3(d)	1,2	2	G	SR 3.3.1.1.1 SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5(a)	2	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

3.3.1.1.4

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) Each APRM channel provides inputs to both trip systems.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable. Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable. The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

(f) Following Detect and Suppress Solution – Confirmation Density (DSS-CD) implementation, DSS-CD is not required to be armed while in the DSS-CD Armed Region during the first reactor startup and during the first controlled shutdown that passes completely through the DSS-CD Armed Region. However, DSS-CD is considered OPERABLE and shall be maintained OPERABLE and capable of automatically arming for operation at recirculation drive flow rates above the DSS-CD Armed Region.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High					
b. Float Switch	1,2	2	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
8. Turbine Stop Valve - Closure	≥ 26% RTP	4	E	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low(d)	≥ 26% RTP	2	E	SR ~~3.3.1.1.8~~ SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 550 psig
10. Reactor Mode Switch - Shutdown Position	1,2	1	G	SR ~~3.3.1.1.12~~ SR 3.3.1.1.14	NA
	5(a)	1	H	SR ~~3.3.1.1.12~~ SR 3.3.1.1.14	NA
11. Manual Scram	1,2	1	G	SR ~~3.3.1.1.8~~ SR 3.3.1.1.14	NA
	5(a)	1	H	SR ~~3.3.1.1.8~~ SR 3.3.1.1.14	NA
12. RPS Channel Test Switches	1,2	2	G	SR 3.3.1.1.4	NA
	5(a)	2	H	SR 3.3.1.1.4	NA
13. Deleted					

$\boxed{3.3.1.1.4}$

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

SURVEILLANCE REQUIREMENTS

NOTE
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified conditions.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.1.2.2	NOTES 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. Verify an OPERABLE SRM detector is located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	~~12 hours~~ Insert 1
SR 3.3.1.2.3	(Deleted) ~~Perform CHANNEL CHECK.~~	~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.4	------------NOTE------------ Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. ------------------------------- Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	12 hours during CORE ALTERATIONS AND ~~24 hours~~
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	~~7 days~~
SR 3.3.1.2.6	------------NOTE------------ Not required to be performed until 12 hours after IRMs on Range 2 or below. ------------------------------- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	~~31 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.7	-------------------NOTES------------------- 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL CALIBRATION.	~~92 days~~ Insert 1

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2[(a)]	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR ~~3.3.1.2.3~~ 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2[(b)(c)]	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.2.1.2	NOTE Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. Perform CHANNEL FUNCTIONAL TEST.	(continued) ~~92 days~~
SR 3.3.2.1.3	NOTE Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.1.4	NOTE Neutron detectors are excluded. Perform CHANNEL CALIBRATION.	~~24 months~~

Insert 1

(continued)

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~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	~~24 months~~
SR 3.3.2.1.6	-----NOTE----- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. ----- Perform CHANNEL FUNCTIONAL TEST.	~~24 months~~
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.8	-----NOTE----- Neutron detectors are excluded. ----- Verify the RBM: a. Low Power Range – Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range – Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤ 82% RTP. c. High Power Range – Upscale Function is not bypassed when THERMAL POWER is > 82% RTP.	~~24 months~~

Insert 1

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

-NOTE-

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	~~24 months~~
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	~~24 months~~

Insert 1

~~shall be implemented before commencing cycle 10 operation.~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	~~31 days~~
SR 3.3.3.1.2	(Deleted)	
SR 3.3.3.1.3	Perform CHANNEL CALIBRATION ~~of the Reactor Pressure Functions~~.	~~184 days~~
~~SR 3.3.3.1.4~~	~~Perform CHANNEL CALIBRATION for each required PAM instrumentation channel except for the Reactor Pressure Function.~~	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	~~24 months~~
SR 3.3.3.2.2	Perform CHANNEL CALIBRATION for ~~the Suppression Pool Water Level Function.~~ each required instrumentation channel	~~24 months~~ Insert 1
~~SR 3.3.3.2.3~~	~~Perform CHANNEL CALIBRATION for each required instrumentation channel except for the Suppression Pool Water Level Function.~~	~~24 months~~

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is $\geq$ 26% RTP.	~~24 months~~
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: $\leq$ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: $\geq$ 550 psig.	~~24 months~~
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

NOTE

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	~~24 hours~~
SR 3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure - High: ≤ 1175 psig.	~~24 months~~
SR 3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~24 months~~

Insert 1

~~-shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c and 3.f; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	~~92 days~~
SR 3.3.5.1.4	~~Perform CHANNEL CALIBRATION.~~	~~184 days~~
SR 3.3.5.1.5	~~Perform CHANNEL CALIBRATION.~~	~~24 months~~
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

(Deleted)

Insert 1

~~-shall be implemented before commencing Cycle 10 operation~~

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level — Low Low Low, Level 1(f)	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure — High(f)	1,2,3	4(b)	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure — Low (Injection Permissive and ECCS Initiation)(f)	1,2,3	4(b) 2 per trip system	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig
d. Core Spray Pump Discharge Flow — Low (Bypass)	1,2,3	2 1 per subsystem	E	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~	≥ 1647 gpm and ≤ 2910 gpm
e. Core Spray Pump Start — Time Delay Relay					
Pumps A,B,C,D (with diesel power)	1,2,3	4 1 per pump	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump A (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds

3.3.5.1.3

(continued)

(a) Deleted.

(b) Channels affect Common Accident Signal Logic. Refer to LCO 3.8.1, "AC Sources - Operating."

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System (continued)					
e. Core Spray Pump Start — Time Delay Relay (continued)					
Pump C (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds
2. Low Pressure Coolant Injection (LPCI) System			3.3.5.1.3		
a. Reactor Vessel Water Level — Low Low Low, Level 1(f)	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure — High(f)	1,2,3	4	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure — Low (Injection Permissive and ECCS Initiation)(f)	1,2,3	4	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig

(continued)

(a) Deleted.

(b) Deleted.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
d. Reactor Steam Dome Pressure — Low (Recirculation Discharge Valve Permissive)[f]	1[c],2[c], 3[c]	4	C	SR 3.3.5.1.2 SR ~~3.3.5.1.4~~ SR 3.3.5.1.6	≥ 215 psig and ≤ 245 psig
e. Reactor Vessel Water Level — Level 0	1,2,3	2 1 per subsystem	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 312 5/16 inches above vessel zero
f. Low Pressure Coolant Injection Pump Start — Time Delay Relay					
Pump A,B,C,D (with diesel power)	1,2,3	4	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6 3.3.5.1.3	≥ 0 seconds and ≤ 1 second
Pump A (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump C (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds

(continued)

(a) Deleted.

(c) With associated recirculation pump discharge valve open.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System.					
a. Reactor Vessel Water Level — Low Low, Level 2(f)	1, $2^{(d)}$, $3^{(d)}$	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 470 inches above vessel zero
b. Drywell Pressure — High(f)	1, $2^{(d)}$,$3^{(d)}$	4	B	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Vessel Water Level — High, Level 8	1, $2^{(d)}$, $3^{(d)}$	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 583 inches above vessel zero
d. Condensate Header Level — Low	1, $2^{(d)}$, $3^{(d)}$	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ Elev. 551 feet
e. Suppression Pool Water Level — High	1, $2^{(d)}$, $3^{(d)}$	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 7 inches above instrument zero
f. High Pressure Coolant Injection Pump Discharge Flow—Low (Bypass)	1, $2^{(d)}$, $3^{(d)}$	1	E	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 671 gpm
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level — Low Low Low, Level 1(f)	1, $2^{(d)}$, $3^{(d)}$	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero

3.3.5.1.3

(continued)

(d) With reactor steam dome pressure > 150 psig.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. ADS Trip System A (continued)					
b. Drywell Pressure — High[f]	1, 2[d], 3[d]	2	F	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2[d], 3[d]	1	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level — Low, Level 3 (Confirmatory)[f]	1, 2[d], 3[d]	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure — High	1, 2[d], 3[d]	4	G 3.3.5.1.3	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure — High	1, 2[d], 3[d]	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2[d], 3[d]	2	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 322 seconds
5. ADS Trip System B					
a. Reactor Vessel Water Level — Low Low Low, Level 1[f]	1, 2[d], 3[d]	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≥ 398 inches above vessel zero

(continued)

(d) With reactor steam dome pressure > 150 psig.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B (continued)					
b. Drywell Pressure — High(f)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level — Low, Level 3 (Confirmatory)(f)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 ~~SR 3.3.5.1.5~~ 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure — High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure — High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	SR ~~3.3.5.1.5~~ SR 3.3.5.1.6	≤ 322 seconds

(d) With reactor steam dome pressure > 150 psig.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1	Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Declare associated low pressure Emergency Core Cooling System (ECCS) injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 2 and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.

(Deleted)

Insert 1

	SURVEILLANCE	FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.6.1.3	~~Perform CHANNEL CALIBRATION.~~	~~92 days~~
SR 3.3.6.1.4	~~Perform CHANNEL CALIBRATION.~~	~~122 days~~
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

~~-shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for performance of a CHANNEL CALIBRATION or maintenance, entry into associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the tripped condition.

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~

Insert 1

~~-shall be implemented before commencing cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

-NOTES-

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each CREV Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CREV initiation capability.
3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for the performance of a CHANNEL CALIBRATION or maintenance, entry into the associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the trip condition.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	~~24 hours~~
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	~~92 days~~
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~184 days~~ Insert 1
~~SR 3.3.7.1.5~~	~~Perform CHANNEL CALIBRATION.~~	~~24 months~~
~~SR 3.3.7.1.6~~	~~Perform LOGIC SYSTEM FUNCTIONAL TEST.~~	~~24 months~~

~~-Shall be implemented before commencing cycle 10 operation~~

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Ventilation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≥ 528 inches above vessel zero
2. Drywell Pressure - High	1,2,3	2	B	SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≤ 2.5 psig
3. Reactor Zone Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≤ 100 mR/hr
4. Refueling Floor Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR ~~3.3.7.1.5~~ 3.3.7.1.3 SR ~~3.3.7.1.6~~ 3.3.7.1.4	≤ 100 mR/hr
5. Control Room Air Supply Duct Radiation - High	1,2,3	1	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 270 cpm above background

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CALIBRATION.	~~184 days~~ Insert 1
SR 3.3.8.1.2	~~Perform CHANNEL CALIBRATION.~~ (Deleted)	~~12 months~~
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~24 months~~ Insert 1

~~—shall be implemented before commencing Cycle 10 operation~~

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BOARD	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Shutdown Board Undervoltage (Loss of Voltage)			
a. Board Undervoltage	2	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	Reset at ≥ 2813 V and ≤ 2927 V
b. Diesel Start Initiation Time Delay	2	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 1.4 seconds and ≤ 1.6 seconds
	$\boxed{3.3.8.1.1}$		
2. 4.16 kV Shutdown Board Undervoltage (Degraded Voltage)			
a. Board Undervoltage	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3900 V and ≤ 3940 V
b.1 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 0.2 seconds and ≤ 0.4 seconds
b.2 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 3 seconds and ≤ 5 seconds
b.3 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 5.15 seconds and ≤ 8.65 seconds
b.4 Time Delay	1	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≥ 0.9 seconds and ≤ 1.7 seconds
3. 4.16 kV Shutdown Board Undervoltage (Unbalanced Voltage Relay)	3	SR ~~3.3.8.1.2~~ SR 3.3.8.1.3	≤ 1.5V at 3 seconds (Permissive Alarm) ≤ 3.4V at 8.65 seconds (Lo) ≤ 20V at 3.5 seconds (High)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	~~184 days~~
SR 3.3.8.2.3	Perform a system functional test.	~~24 months~~

Insert 1

~~shall be implemented before commencing cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.1.1	------------------------NOTE------------------------ Not required to be performed until 24 hours after both recirculation loops are in operation. -- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	~~24 hours~~ Insert 1

~~- shall be implemented at the end of the cycle 9 outage~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.2.1	---------------------------NOTES--------------------- 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 23% RTP. --- Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	---------------------------NOTE--------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each required S/RV opens when manually actuated.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	~~12 hours~~
SR 3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	~~31 days~~
SR 3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	~~184 days~~
SR 3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	~~24 months~~

Insert 1

~~-shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	---NOTE--- Only required to be performed in MODE 1. Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is $\leq 3.2\ \mu Ci/gm$.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	-------------------NOTE------------------- Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR low pressure permissive pressure. --- Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.9.1	------------------NOTES------------------ 1. Only required to be performed during RCS heatup and cooldown operations or RCS inservice leak and hydrostatic testing when the vessel pressure is > 313 psig. 2. The limits of Figure 3.4.9-2 may be applied during nonnuclear heatup and ambient loss cooldown associated with inservice leak and hydrostatic testing provided that the heatup and cooldown rates are ≤ 15°F/hour. 3. The limits of Figures 3.4.9-1 and 3.4.9-2 do not apply when the tension from the reactor head flange bolting studs is removed. --- Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	Insert 1 ~~30 minutes~~
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-1, Curve No. 3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.9.5	-------------------------NOTES---------------------- 1. Only required to be performed when tensioning the reactor vessel head bolting studs. 2. The reactor vessel head bolts may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. -- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~30 minutes~~
SR 3.4.9.6	-------------------------NOTE---------------------- Not required to be performed until 30 minutes after RCS temperature ≤ 85°F in MODE 4. -- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~30 minutes~~
SR 3.4.9.7	-------------------------NOTE---------------------- Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. -- Verify reactor vessel flange and head flange temperatures are > 83°F.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify reactor steam dome pressure is ≤ 1050 psig.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.1.2	-------------------NOTE------------------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. -- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	~~31 days~~
SR 3.5.1.4	Verify the LPCI cross tie valve is closed and power is removed from the valve operator. or Verify the manual shutoff valve in the LPCI cross tie is closed.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.1.7	------------NOTE------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ------------------------------ Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.1.8	------------NOTE------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ------------------------------ Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~24 months~~
SR 3.5.1.9	------------NOTE------------ Vessel injection/spray may be excluded. ------------------------------ Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	~~24 months~~

Insert 1

(continued)

~~shall be implemented before commencing cycle 10 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.10	------------------------NOTE------------------------ Valve actuation may be excluded. --- Verify the ADS actuates on an actual or simulated automatic initiation signal.	~~24 months~~ Insert 1
SR 3.5.1.11	------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each ADS valve opens when manually actuated.	~~24 months~~ Insert 1
SR 3.5.1.12	(Deleted)	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	~~12 hours~~
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	~~12 hours~~
SR 3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.2.4	Verify for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	~~92 days~~
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal. (continued)	~~24 months~~
SR 3.5.2.7	------------------------------NOTE------------------------------ Vessel injection/spray may be excluded. -- Verify the required ECCS injection/spray subsystem can be manually operated.	~~24 months~~

Insert 1

Move to new page

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.3.3	-------------------NOTE------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.3.4	-------------------NOTE------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~24 months~~

Insert 1

(continued)

~~-shall be implemented before commencing cycle 10 operation~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.5.3.5	-------NOTE------- Vessel injection may be excluded. ------------------ Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	~~24 months~~ Insert 1

~~-shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute over a 10 minute period at an initial differential pressure of 1 psid.	~~24 months~~ Insert 1

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.2.1	------------------------------NOTES------------------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. --- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.3.1	-----NOTE----- Not required to be met when the 18 and 20 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. -----	
	Verify each 18 and 20 inch primary containment purge valve is closed.	~~31 days~~
SR 3.6.1.3.2	-----NOTES----- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for instrument panel valves, vent and drain valves, leak-off lines, and test connection valves. -----	
	Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	~~31 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.1.3.3	-------------------NOTES------------------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for vent and drain valves, leak-off lines, and test connection valves. --- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	~~24 months~~
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	~~24 months~~
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.4.1	Verify drywell average air temperature is within limit.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.5.1	-----NOTES----- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. ---------- Verify each vacuum breaker is closed.	~~14 days~~
SR 3.6.1.5.2	Perform a functional test of each vacuum breaker.	~~92 days~~
SR 3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is ≤ 0.5 psid.	~~24 months~~

Insert 1

~~shall be implemented before commencing cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.6.1	-------------------------NOTES------------------------- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. --- Verify each vacuum breaker is closed.	~~14 days~~ Insert 1
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	~~24 hours~~ Insert 1 AND 5 minutes when performing testing that adds heat to the suppression pool

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	~~5 years~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~
SR 3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	~~5 years~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify ≥ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	~~31 days~~ Insert 1
SR 3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	~~31 days~~
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	~~31 days~~
SR 3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 120 seconds.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.4.1.4	Verify two SGT subsystems can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate ≤ 12,000 cfm.	~~24 months on a STAGGERED TEST BASIS~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	~~92 days~~ Insert 1
SR 3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~

~~-shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	~~31 days~~
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	~~24 months~~
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	~~12 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1

Delete row

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	~~24 hours~~
SR 3.7.2.2	---NOTE--- Isolation of flow to individual components does not render EECW System inoperable. ------ Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	~~31 days~~
SR 3.7.3.2	Perform required CREV filter testing in accordance with the VFTP.	In accordance with the VFTP
SR 3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	~~24 months~~
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	~~24 months~~ Insert 1

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	~~31 days~~ Insert 1
SR 3.7.5.2	Perform a system functional test.	~~24 months~~
SR 3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	~~24 months~~

~~-shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.6.1	Verify the spent fuel storage pool water level is ≥ 21.5 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

NOTE

SR 3.8.1.1 through SR 3.8.1.9 are applicable to the Unit 3 AC sources. SR 3.8.1.10 is applicable only to Unit 1 and 2 AC sources.

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	NOTES 1. Performance of SR 3.8.1.4 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.4 must be met. Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	Insert 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	---NOTES--- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.1 or SR 3.8.1.4. --- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2295 kW and ≤ 2550 kW.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	~~31 days~~
SR 3.8.1.4	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ------------------------------ Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3940 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.5	-NOTE- If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9.	
	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; and b. Following load rejection, the steady state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	~~24 months~~ Insert 1
SR 3.8.1.6	-NOTE- All DG starts may be preceded by an engine prelube period followed by a warmup period.	
	Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	~~24 months~~ Insert 1

(continued)

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	-------------------NOTE------------------- Momentary transients outside the load and power factor ranges do not invalidate this test. -- Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2680 kW and ≤ 2805 kW; and b. For the remaining hours of the test loaded ≥ 2295 kW and ≤ 2550 kW.	~~24 months~~
SR 3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	~~24 months~~

Insert 1

(continued)

~~shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	---NOTE--- All DG starts may be preceded by an engine prelube period. --- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~24 months~~ Insert 1
SR 3.8.1.10	For required Unit 1 and 2 DGs, the SRs of Unit 1 and 2 Technical Specifications are applicable.	In accordance with applicable SRs

~~-Shall be implemented before commencing Cycle 10 operation~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply of fuel.	~~31 days~~
SR 3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	~~31 days~~
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required DG air start receiver unit pressure is ≥ 165 psig.	~~31 days~~
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	~~7 days~~
SR 3.8.4.2	-------------------NOTE------------------- Performance of SR 3.8.4.5 satisfies this SR. -- Verify each required battery charger charges its respective battery after the battery's ~~24 month~~ service test.	~~24 months~~ Insert 1
SR 3.8.4.3	-------------------NOTE------------------- The modified performance discharge test in SR 3.8.4.4 may be performed in lieu of the service test in SR 3.8.4.3 ~~once per 60 months~~. -- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~24 months~~

(continued)

~~shall be implemented before commencing cycle 10 operation~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~60 months~~ AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of expected life with capacity ≥ 100% of manufacturer's rating
SR 3.8.4.5	——————NOTE—————— Credit may be taken for unplanned events that satisfy this SR. —————————————— Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	~~60 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	~~7 days~~
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	~~92 days~~
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for each Unit and Shutdown Board battery (except Shutdown Board battery 3EB), and ≥ 40°F for Shutdown Board battery 3EB and each DG battery.	~~92 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in refuel position.	~~12 hours~~
SR 3.9.2.2	------------------NOTE------------------ Not required to be performed until 1 hour after any control rod is withdrawn. --- Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.5.1	-------------------NOTE------------------- Not required to be performed until 7 days after the control rod is withdrawn. ---	
	Insert each withdrawn control rod at least one notch.	~~7 days~~ Insert 1
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	~~12 hours~~ Insert 1
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.3.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.3.2	-----NOTE----- Not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements. ---------- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~ Insert 1
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	-----NOTE----- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. ----- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~24 hours~~ Insert 1
SR 3.10.4.4	-----NOTE----- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. ----- Verify a control rod withdrawal block is inserted.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	~~24 hours~~
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	~~24 hours~~
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	~~24 hours~~
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	~~24 hours~~ Insert 1
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	~~24 hours~~
SR 3.10.6.3	------------NOTE------------ Only required to be met during fuel loading. ---------------------------- Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d and 2.e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.8.2	---NOTE--- Not required to be met if SR 3.10.8.3 satisfied. ---	
	Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 2 of Table 3.3.2.1-1.	According to the applicable SRs
SR 3.10.8.3	---NOTE--- Not required to be met if SR 3.10.8.2 satisfied. ---	
	Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.	During control rod movement
SR 3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	~~12 hours~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.8.5	Verify each withdrawn control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position AND Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.8.6	Verify CRD charging water header pressure ≥ 940 psig.	~~7 days~~ Insert 1

5.5 Programs and Manuals

5.5.14 Residual Heat Removal (RHR) Heat Exchanger Performance Monitoring Program

This program is established to ensure that the RHR heat exchangers are maintained in a condition that meets or exceeds the minimum performance capability assumed in containment analyses, which support not taking credit for containment accident pressure in the NPSH analyses. The RHR heat exchanger testing and determination of overall uncertainty in the fouling resistance shall be in accordance with the guidelines in EPRI report, EPRI 3002005340, Service Water Heat Exchanger Test Guidelines, May 2015. This program establishes the following attributes.

a. The program establishes provisions to periodically monitor RHR heat exchanger thermal performance. The program includes frequency of monitoring and the methodology considers uncertainty of the result.

b. The program establishes and controls acceptance criteria for RHR heat exchanger worst fouling resistance and number of plugged tubes.

c. The program establishes limitations and allows for compensatory actions if degraded performance is observed.

d. Changes to the program shall be made under appropriate administrative review.

e. Details of the program including program limitations, compensatory actions for degraded performance, testing method, data acquisition method, data reduction method, overall uncertainty determination method, thermal performance analysis, acceptance criteria, and computer programs used that meet the 10 CFR 50 Appendix B, and 10 CFR 21 requirements are described in the UFSAR.

Insert 2

Insert new page

Attachment 4.1 to CNL-20-003

Proposed Technical Specification Pages (Unit 1 Re-Typed)
(118 total pages)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	In accordance with the Surveillance Frequency Control Program
SR 3.1.3.2	(Deleted).	
SR 3.1.3.3	--------------------------NOTE------------------------- Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. -- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 06 is $\leq$ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS

---NOTE---
During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown ≥ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.2	Verify continuity of explosive charge.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.3	Verify the SPB concentration is ≥ 8.0% by weight.	In accordance with the Surveillance Frequency Control Program AND Once within 24 hours after water or boron is added to solution
SR 3.1.7.4	Verify the SPB concentration is ≤ 9.2% by weight. OR	In accordance with the Surveillance Frequency Control Program AND Once within 24 hours after water or boron is added to solution (continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
	Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Once within 8 hours after discovery that SPB concentration is > 9.2% by weight <u>AND</u> 12 hours thereafter
SR 3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.6	Verify the SLC conditions satisfy the following equation: $\frac{(\quad C \quad)(\quad Q \quad)(\quad E \quad)}{(8.7 \text{ wt.\%})(50 \text{ gpm})(94 \text{ atom\%})} \geq 1$ where, C = sodium pentaborate solution concentration (weight percent) Q = pump flow rate (gpm) E = Boron-10 enrichment (atom percent Boron-10)	In accordance with the Surveillance Frequency Control Program <u>AND</u> Once within 24 hours after water or boron is added to the solution

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	In accordance with the Surveillance Frequency Control Program <u>AND</u> After addition to SLC tank
SR 3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	---------------------------NOTE--------------------------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. --- Verify each SDV vent and drain valve is open.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in $\leq$ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 AND Once within 72 hours after each completion of SR 3.1.4.2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.2	--------------------------NOTE-------------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. --- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.3	--------------------------NOTE-------------------------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.5	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.6	--------------------------NOTE------------------------- Only required to be met during entry into MODE 2 from MODE 1. -- Verify the IRM and APRM channels overlap.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.7	Calibrate the local power range monitors.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.8	(Deleted)	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.9	-------------------------NOTES------------------------ 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.11	(Deleted)	
SR 3.3.1.1.12	(Deleted)	
SR 3.3.1.1.13	--------------------------NOTE------------------------- Neutron detectors are excluded. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.15	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.16	---------------------------NOTE-------------------------- For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.17	(Deleted).	

-

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3[b]	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	≥18% [f]	3[b]	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16	NA
3. Reactor Vessel Steam Dome Pressure - High[d]	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3[d]	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. High Drywell Pressure	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5[a]	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.
(b) Each APRM channel provides inputs to both trip systems.
(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.
The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.
(f) Following Detect and Suppress Solution – Confirmation Density (DSS-CD) implementation, DSS-CD is not required to be armed while in the DSS-CD Armed Region during the first reactor startup and during the first controlled shutdown that passes completely through the DSS-CD Armed Region. However, DSS-CD is considered OPERABLE and shall be maintained OPERABLE and capable of automatically arming for operation at recirculation drive flow rates above the DSS-CD Armed Region.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High (continued)					
b. Float Switch	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
8. Turbine Stop Valve - Closure	≥ 26% RTP	4	E	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low(d)	≥ 26% RTP	2	E	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 550 psig
10. Reactor Mode Switch - Shutdown Position	1,2	1	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
	5(a)	1	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
11. Manual Scram	1,2	1	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
	5(a)	1	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
12. RPS Channel Test Switches	1,2	2	G	SR 3.3.1.1.4	NA
	5(a)	2	H	SR 3.3.1.1.4	NA

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified conditions.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.2	-------------------------NOTES------------------------ 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. --- Verify an OPERABLE SRM detector is located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.3	(Deleted)	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2.4	--------------------------NOTE------------------------- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. --- Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	12 hours during CORE ALTERATIONS <u>AND</u> In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.6	--------------------------NOTE------------------------- Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.7	-------------------------NOTES------------------------ 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2[(a)]	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2[(b)(c)]	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.2	-------------------------NOTE------------------------ Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.3	--------------------------NOTE-------------------------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.4	--------------------------NOTE-------------------------- Neutron detectors are excluded. -- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.6	--------------------------NOTE------------------------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.8	--------------------------NOTE------------------------- Neutron detectors are excluded. --- Verify the RBM: a. Low Power Range - Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range - Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤ 82% RTP. c. High Power Range - Upscale Function is not bypassed when THERMAL POWER is > 82% RTP.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.1.2	(Deleted).	
SR 3.3.3.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2.2	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: ≤ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: ≥ 550 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure - High: ≤ 1175 psig	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c and 3.f; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.4	(Deleted)	
SR 3.3.5.1.5	(Deleted)	
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High(e)	1,2,3	4(b)	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)(e)	1,2,3	4(b) 2 per trip system	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig
d. Core Spray Pump Discharge Flow - Low (Bypass)	1,2,3	2 1 per subsystem	E	SR 3.3.5.1.2 SR 3.3.5.1.3	≥ 1647 gpm and ≤ 2910 gpm
e. Core Spray Pump Start - Time Delay Relay					
Pumps A,B,C,D (with diesel power)	1,2,3	4 1 per pump	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump A (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds

(continued)

(a) Deleted.

(b) Channels affect Common Accident Signal Logic. Refer to LCO 3.8.1, "AC Sources - Operating."

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System (continued)					
e. Core Spray Pump Start - Time Delay Relay (continued)					
Pump C (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High(e)	1,2,3	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)(e)	1,2,3	4	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig

(continued)

(a) Deleted.

(b) Deleted.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
d. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive)(e)	1(c),2(c), 3(c)	4	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 215 psig and ≤ 245 psig
e. Reactor Vessel Water Level - Level 0	1,2,3	2 1 per subsystem	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 312 5/16 inches above vessel zero
f. Low Pressure Coolant Injection Pump Start - Time Delay Relay					
Pump A,B,C,D (with diesel power)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump A (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump C (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds

(continued)

(a) Deleted.

(c) With associated recirculation pump discharge valve open.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low, Level 2(e)	1, 2(d), 3(d)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 470 inches above vessel zero
b. Drywell Pressure - High(e)	1, 2(d),3(d)	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Vessel Water Level - High, Level 8	1, 2(d), 3(d)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 583 inches above vessel zero
d. Condensate Header Level - Low	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ Elev. 551 feet
e. Suppression Pool Water Level - High	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 7 inches above instrument zero
f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2(d), 3(d)	1	E	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 671 gpm
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. ADS Trip System A (continued)					
b. Drywell Pressure - High[(e)]	1, $2^{(d)}$, $3^{(d)}$	2	F	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, $2^{(d)}$, $3^{(d)}$	1	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)[(e)]	1, $2^{(d)}$, $3^{(d)}$	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, $2^{(d)}$, $3^{(d)}$	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, $2^{(d)}$, $3^{(d)}$	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, $2^{(d)}$, $3^{(d)}$	2	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 322 seconds
5. ADS Trip System B					
a. Reactor Vessel Water Level - Low Low Low, Level 1[(e)]	1, $2^{(d)}$, $3^{(d)}$	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure – High[(e)]	1, $2^{(d)}$, $3^{(d)}$	2	F	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B (continued)					
c. Automatic Depressurization System Initiation Timer	1, $2^{(d)}$, $3^{(d)}$	1	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)$^{(e)}$	1, $2^{(d)}$, $3^{(d)}$	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, $2^{(d)}$, $3^{(d)}$	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, $2^{(d)}$, $3^{(d)}$	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, $2^{(d)}$, $3^{(d)}$	2	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 322 seconds

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1	Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Declare association low pressure Emergency Core Cooling System (ECCS) injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTES---

Refer to Table 3.3.5.2-1 to determine which SRs apply for each RCIC Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 2 and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTES---

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.3	(Deleted)	
SR 3.3.6.1.4	(Deleted)	
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for performance of a CHANNEL CALIBRATION or maintenance, entry into associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the tripped condition.

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each CREV Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CREV initiation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for the performance of a CHANNEL CALIBRATION or maintenance, entry into the associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the trip condition.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Ventilation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≥ 528 inches above vessel zero
2. Drywell Pressure - High	1,2,3	2	B	SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 2.5 psig
3. Reactor Zone Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 100 mR/hr
4. Refueling Floor Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 100 mR/hr
5. Control Room Air Supply Duct Radiation - High	1,2,3	1	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 270 cpm above background

SURVEILLANCE REQUIREMENTS

---NOTE---

Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.2	(Deleted)	
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

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Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BOARD	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Shutdown Board Undervoltage (Loss of Voltage)			
a. Board Undervoltage	2	SR 3.3.8.1.1 SR 3.3.8.1.3	Reset at ≥ 2813 V and ≤ 2927 V
b. Diesel Start Initiation Time Delay	2	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 1.4 seconds and ≤ 1.6 seconds
2. 4.16 kV Shutdown Board Undervoltage (Degraded Voltage)			
a. Board Undervoltage	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3900 V and ≤ 3940 V
b.1 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 0.2 seconds and ≤ 0.4 seconds
b.2 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3 seconds and ≤ 5 seconds
b.3 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 5.15 seconds and ≤ 8.65 seconds
b.4 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 0.9 seconds and ≤ 1.7 seconds
3. 4.16 kV Shutdown Board Undervoltage (Unbalanced Voltage Relay)	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≤ 1.5V at 3 seconds (Permissive Alarm) ≤ 3.4V at 8.65 seconds (Lo) ≤ 20V at 3.5 seconds (High)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.3	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	--------------------------NOTE------------------------- Not required to be performed until 24 hours after both recirculation loops are in operation. --- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	-----------------------------NOTES--------------------------- 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 23% RTP. --- Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	---------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each required S/RV opens when manually actuated.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	---------------------------NOTE------------------------ Only required to be performed in MODE 1. --- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 3.2 μCi/gm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	---------------------------NOTE------------------------ Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR low pressure permissive pressure. --- Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	----------------------------NOTES------------------------ 1. Only required to be performed during RCS heatup and cooldown operations or RCS inservice leak and hydrostatic testing when the vessel pressure is > 312 psig. 2. The limits of Figure 3.4.9-2 may be applied during nonnuclear heatup and ambient loss cooldown associated with inservice leak and hydrostatic testing provided that the heatup and cooldown rates are ≤ 15°F/hour. 3. The limits of Figures 3.4.9-1 and 3.4.9-2 do not apply when the tension from the reactor head flange bolting studs is removed. ---	
	Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-1, Curve No. 3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.5	--------------------------NOTES------------------------ 1. Only required to be performed when tensioning the reactor vessel head bolting studs. 2. The reactor vessel head bolts may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	 In accordance with the Surveillance Frequency Control Program
SR 3.4.9.6	--------------------------NOTE------------------------ Not required to be performed until 30 minutes after RCS temperature ≤ 85°F in MODE 4. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	 In accordance with the Surveillance Frequency Control Program
SR 3.4.9.7	--------------------------NOTE------------------------ Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	 In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify reactor steam dome pressure is ≤ 1050 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	-------------------------NOTE------------------------ Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. --- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.4	Deleted.	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	---------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.8	---------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.9	---------------------------NOTE------------------------- Vessel injection/spray may be excluded. -- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.10	--------------------------NOTE------------------------- Valve actuation may be excluded. -- Verify the ADS actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.11	--------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify each ADS valve opens when manually actuated.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.12	(Deleted).	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.7	-----------------------------NOTE------------------------ Vessel injection/spray may be excluded. --- Verify the required ECCS injection/spray subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.4	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	--------------------------NOTE------------------------- Vessel injection may be excluded. -- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute over a 10 minute period at an initial differential pressure of 1 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.1	-------------------------NOTES------------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. --- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	-------------------------NOTE------------------------ Not required to be met when the 18 and 20 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. --- Verify each 18 and 20 inch primary containment purge valve is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.2	-------------------------NOTES---------------------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for instrument panel valves, vent and drain valves, leak-off lines, and test connection valves. --- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.3	-------------------------NOTES------------------------ 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for vent and drain valves, leak-off lines, and test connection valves. -- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.4.1	Verify drywell average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. --- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.5.2	Perform a functional test of each vacuum breaker.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is $\leq$ 0.5 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. --- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	In accordance with the Surveillance Frequency Control Program <u>AND</u> 5 minutes when performing testing that adds heat to the suppression pool

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate $\geq$ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify $\geq$ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 120 seconds.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.4	Verify two SGT subsystems can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate ≤ 12,000 cfm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.2	-------------------------NOTE------------------------- Isolation of flow to individual components does not render EECW System inoperable. --	
	Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.2	Perform required CREV filter testing in accordance with the VFTP.	In accordance with the VFTP
SR 3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the spent fuel storage pool water level is ≥ 21.5 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
SR 3.8.1.1 through SR 3.8.1.9 are applicable to the Unit 1 and 2 AC sources.
SR 3.8.1.10 is applicable only to Unit 3 AC sources.

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	-------------------------NOTES------------------------ 1. Performance of SR 3.8.1.4 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.4 must be met. ---	
	Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	-------------------------NOTES------------------------ 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.1 or SR 3.8.1.4. ---	
	Verify each DG is synchronized and loaded and operates for $\geq$ 60 minutes at a load $\geq$ 2295 kW and $\leq$ 2550 kW.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.4	--------------------------NOTE------------------------- All DG starts may be preceded by an engine prelube period. ---	
	Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3940 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.5	-------------------------NOTE------------------------ If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. --- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; and b. Following load rejection, the steady state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.6	-------------------------NOTE------------------------ All DG starts may be preceded by an engine prelube period followed by a warmup period. --- Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	--------------------------NOTE------------------------- Momentary transients outside the load and power factor ranges do not invalidate this test. --- Verify each DG operating at a power factor $\leq$ 0.9 operates for $\geq$ 24 hours: a. For $\geq$ 2 hours loaded $\geq$ 2680 kW and $\leq$ 2805 kW; and b. For the remaining hours of the test loaded $\geq$ 2295 kW and $\leq$ 2550 kW.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	--------------------------NOTE------------------------- All DG starts may be preceded by an engine prelube period. --- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	For required Unit 3 DGs, the SRs of Unit 3 Technical Specifications are applicable.	In accordance with applicable SRs

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply of fuel.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required DG air start receiver unit pressure is ≥ 165 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	-------------------------NOTE------------------------ Performance of SR 3.8.4.5 satisfies this SR. --- Verify each required battery charger charges its respective battery after the battery's service test.	 In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	-------------------------NOTE------------------------ The modified performance discharge test in SR 3.8.4.4 may be performed in lieu of the service test in SR 3.8.4.3. --- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	 In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of expected life with capacity ≥ 100% of manufacturer's rating
SR 3.8.4.5	--------------------------NOTE------------------------- Credit may be taken for unplanned events that satisfy this SR. --- Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for each Unit and Shutdown Board battery (except Shutdown Board battery 3EB), and ≥ 40°F for Shutdown Board battery 3EB and each DG battery.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in refuel position.	In accordance with the Surveillance Frequency Control Program
SR 3.9.2.2	--------------------------NOTE-------------------------- Not required to be performed until 1 hour after any control rod is withdrawn. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	-------------------------NOTE------------------------ Not required to be performed until 7 days after the control rod is withdrawn. --- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	In accordance with the Surveillance Frequency Control Program
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.3.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.3.2	-------------------------NOTE------------------------ Not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements. --- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	------------------------NOTE------------------------ Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. --	
	Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.4.4	------------------------NOTE------------------------ Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. --	
	Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.6.3	--------------------------NOTE------------------------- Only required to be met during fuel loading. -- Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.8.2	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.3 satisfied. --- Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 2 of Table 3.3.2.1-1.	According to the applicable SRs
SR 3.10.8.3	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.2 satisfied. --- Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.	During control rod movement
SR 3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.8.5	Verify each withdrawn control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position <u>AND</u> Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.8.6	Verify CRD charging water header pressure $\geq$ 940 psig.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.14 Residual Heat Removal (RHR) Heat Exchanger Performance Monitoring Program

This program is established to ensure that the RHR heat exchangers are maintained in a condition that meets or exceeds the minimum performance capability assumed in containment analyses, which support not taking credit for containment accident pressure in the NPSH analyses. The RHR heat exchanger testing and determination of overall uncertainty in the fouling resistance shall be in accordance with the guidelines in EPRI report, EPRI 3002005340, Service Water Heat Exchanger Test Guidelines, May 2015. This program establishes the following attributes.

a. The program establishes provisions to periodically monitor RHR heat exchanger thermal performance. The program includes frequency of monitoring and the methodology considers uncertainty of the results.

b. The program establishes and controls acceptance criteria for RHR heat exchanger worst fouling resistance and number of plugged tubes.

c. The program establishes limitations and allows for compensatory actions if degraded performance is observed.

d. Changes to the program shall be made under appropriate administrative review.

e. Details of the program including program limitations, compensatory actions for degraded performance, testing method, data acquisition method, data reduction method, overall uncertainty determination method, thermal performance analysis, acceptance criteria, and computer programs used that meet the 10 CFR 50 Appendix B, and 10 CFR 21 requirements are described in the UFSAR.

5.5.15 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

5.5 Programs and Manuals

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a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

Attachment 4.2 to CNL-20-003

Proposed Technical Specification Pages (Unit 2 Re-Typed)
(117 total pages)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	In accordance with the Surveillance Frequency Control Program
SR 3.1.3.2	(Deleted).	
SR 3.1.3.3	-------------------------NOTE------------------------ Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. --- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 06 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS

---NOTE---
During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown ≥ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.2	Verify continuity of explosive charge.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.3	Verify the SPB concentration is ≥ 8.0% by weight.	In accordance with the Surveillance Frequency Control Program AND Once within 24 hours after water or boron is added to solution
SR 3.1.7.4	Verify the SPB concentration is ≤ 9.2% by weight. OR	In accordance with the Surveillance Frequency Control Program AND Once within 24 hours after water or boron is added to solution (continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
	Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Once within 8 hours after discovery that SPB concentration is > 9.2% by weight <u>AND</u> 12 hours thereafter
SR 3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.6	Verify the SLC conditions satisfy the following equation: $\frac{(C)(Q)(E)}{(8.7\text{ wt.\%})(50\text{ gpm})(94\text{ atom\%})} \geq 1$ where, C = sodium pentaborate solution concentration (weight percent) Q = pump flow rate (gpm) E = Boron-10 enrichment (atom percent Boron-10)	In accordance with the Surveillance Frequency Control Program <u>AND</u> Once within 24 hours after water or boron is added to the solution

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	In accordance with the Surveillance Frequency Control Program <u>AND</u> After addition to SLC tank
SR 3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	---------------------------NOTE--------------------------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. --- Verify each SDV vent and drain valve is open.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after $\geq$ 23% RTP AND In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 <u>AND</u> Once within 72 hours after each completion of SR 3.1.4.2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.2	--------------------------NOTE------------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. --- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.3	--------------------------NOTE------------------------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.5	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.6	--------------------------NOTE------------------------- Only required to be met during entry into MODE 2 from MODE 1. --- Verify the IRM and APRM channels overlap.	 In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.7	Calibrate the local power range monitors.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.8	(Deleted)	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.9	-------------------------NOTES------------------------ 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.11	(Deleted)	
SR 3.3.1.1.12	(Deleted)	
SR 3.3.1.1.13	-------------------------NOTE------------------------ Neutron detectors are excluded. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.15	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.16	---------------------------NOTE-------------------------- For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.17	(Deleted).	

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Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3[(b)]	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	≥18%[(f)]	3[(b)]	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16	NA
3. Reactor Vessel Steam Dome Pressure - High[(d)]	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3[(d)]	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5[(a)]	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) Each APRM channel provides inputs to both trip systems.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.
The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

(f) Following Detect and Suppress Solution – Confirmation Density (DSS-CD) implementation, DSS-CD is not required to be armed while in the DSS-CD Armed Region during the first reactor startup and during the first controlled shutdown that passes completely through the DSS-CD Armed Region. However, DSS-CD is considered OPERABLE and shall be maintained OPERABLE and capable of automatically arming for operation at recirculation drive flow rates above the DSS-CD Armed Region.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High (continued)					
b. Float Switch	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
8. Turbine Stop Valve - Closure	≥ 26% RTP	4	E	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low(d)	≥ 26% RTP	2	E	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 550 psig
10. Reactor Mode Switch - Shutdown Position	1,2	1	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
	5(a)	1	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
11. Manual Scram	1,2	1	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
	5(a)	1	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
12. RPS Channel Test Switches	1,2	2	G	SR 3.3.1.1.4	NA
	5(a)	2	H	SR 3.3.1.1.4	NA
13. Deleted					

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified conditions.

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.2	------------------------NOTES------------------------ 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. --- Verify an OPERABLE SRM detector is located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.3	(Deleted)	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.4	--------------------------NOTE------------------------- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. -- Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	12 hours during CORE ALTERATIONS <u>AND</u> In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.6	--------------------------NOTE------------------------- Not required to be performed until 12 hours after IRMs on Range 2 or below. -- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.7	-------------------------NOTES------------------------ 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2[(a)]	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2[(b)(c)]	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

SURVEILLANCE REQUIREMENTS

--NOTES--
1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.2	--------------------------NOTE------------------------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.3	--------------------------NOTE------------------------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.4	--------------------------NOTE------------------------- Neutron detectors are excluded. -- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.6	--------------------------NOTE------------------------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.8	-------------------------NOTE------------------------- Neutron detectors are excluded. --- Verify the RBM: a. Low Power Range -- Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range – Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤ 82% RTP. c. High Power Range -- Upscale Function is not bypassed when THERMAL POWER is > 82% RTP.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.1.2	(Deleted).	
SR 3.3.3.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2.2	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is $\geq$ 26% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: $\leq$ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: $\geq$ 550 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: $\geq$ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure - High: $\leq$ 1175 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c and 3.f; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.4	(Deleted)	
SR 3.3.5.1.5	(Deleted)	
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1,2,3,	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High(e)	1,2,3	4(b)	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)(e)	1,2,3	4(b) 2 per trip system	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig
d. Core Spray Pump Discharge Flow - Low (Bypass)	1,2,3,	2 1 per subsystem	E	SR 3.3.5.1.2 SR 3.3.5.1.3	≥ 1647 gpm and ≤ 2910 gpm
e. Core Spray Pump Start - Time Delay Relay					
Pumps A,B,C,D (with diesel power)	1,2,3,	4 1 per pump	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump A (with normal power)	1,2,3,	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3,	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds

(continued)

(a) (Deleted)

(b) Channels affect Common Accident Signal Logic. Refer to LCO 3.8.1, "AC Sources - Operating."

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System (continued)					
e. Core Spray Pump Start - Time Delay Relay (continued)					
Pump C (with normal power)	1,2,3,	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3,	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level - Low Low Low, Level 1[(e)]	1,2,3,	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure - High[(e)]	1,2,3	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure - Low (Injection Permissive and ECCS Initiation)[(e)]	1,2,3	4	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig

(continued)

(a) Deleted.

(b) Deleted.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
d. Reactor Steam Dome Pressure - Low (Recirculation Discharge Valve Permissive)(b)	1(c),2(c), 3(c)	4	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 215 psig and ≤ 245 psig
e. Reactor Vessel Water Level - Level 0	1,2,3	2 1 per subsystem	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 312 5/16 inches above vessel zero
f. Low Pressure Coolant Injection Pump Start - Time Delay Relay					
Pump A,B,C,D (with diesel power)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump A (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump C (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds

(continued)

(a) Deleted.

(c) With associated recirculation pump discharge valve open.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low, Level 2(e)	1, 2(d), 3(d)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 470 inches above vessel zero
b. Drywell Pressure - High(e)	1, 2(d),3(d)	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Vessel Water Level - High, Level 8	1, 2(d), 3(d)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 583 inches above vessel zero
d. Condensate Header Level - Low	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ Elev. 551 feet
e. Suppression Pool Water Level - High	1, 2(d), 3(d)	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 7 inches above instrument zero
f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2(d), 3(d)	1	E	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 671 gpm
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level - Low Low Low, Level 1(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. ADS Trip System A (continued)					
b. Drywell Pressure - High[(e)]	1, 2[(d)], 3[(d)]	2	F	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2[(d)], 3[(d)]	1	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)[(e)]	1, 2[(d)], 3[(d)]	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, 2[(d)], 3[(d)]	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2[(d)], 3[(d)]	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2[(d)], 3[(d)]	2	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 322 seconds
5. ADS Trip System B					
a. Reactor Vessel Water Level - Low Low Low, Level 1[(e)]	1, 2[(d)], 3[(d)]	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero

(continued)

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B (continued)					
b. Drywell Pressure - High(e)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level - Low, Level 3 (Confirmatory)(e)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure - High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure - High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 322 seconds

(d) With reactor steam dome pressure > 150 psig.

(e) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1	Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Declare associated low pressure Emergency Core Cooling System (ECCS) injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---
1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 2 and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.3	(Deleted)	
SR 3.3.6.1.4	(Deleted)	
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for performance of a CHANNEL CALIBRATION or maintenance, entry into associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the tripped condition.

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each CREV Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CREV initiation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for the performance of a CHANNEL CALIBRATION or maintenance, entry into the associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the trip condition.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Ventilation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 3	1,2,3,(a)	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≥ 528 inches above vessel zero
2. Drywell Pressure - High	1,2,3	2	B	SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 2.5 psig
3. Reactor Zone Exhaust Radiation - High	1,2,3 (a)	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 100 mR/hr
4. Refueling Floor Exhaust Radiation - High	1,2,3, (a)	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 100 mR/hr
5. Control Room Air Supply Duct Radiation - High	1,2,3, (a)	1	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 270 cpm above background

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.2	(Deleted)	
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BOARD	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Shutdown Board Undervoltage (Loss of Voltage)			
a. Board Undervoltage	2	SR 3.3.8.1.1 SR 3.3.8.1.3	Reset at ≥ 2813 V and ≤ 2927 V
b. Diesel Start Initiation Time Delay	2	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 1.4 seconds and ≤ 1.6 seconds
2. 4.16 kV Shutdown Board Undervoltage (Degraded Voltage)			
a. Board Undervoltage	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3900 V and ≤ 3940 V
b.1 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 0.2 seconds and ≤ 0.4 seconds
b.2 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3 seconds and ≤ 5 seconds
b.3 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 5.15 seconds and ≤ 8.65 seconds
b.4 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 0.9 seconds and ≤ 1.7 seconds
3. 4.16 kV Shutdown Board Undervoltage (Unbalanced Voltage Relay)	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≤ 1.5V at 3 seconds (Permissive Alarm) ≤ 3.4V at 8.65 seconds (Lo) ≤ 20V at 3.5 seconds (High)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.3	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	--------------------------NOTE------------------------- Not required to be performed until 24 hours after both recirculation loops are in operation. -- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	---------------------------NOTES---------------------- 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 23% RTP. ---	
	Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	---------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each required S/RV opens when manually actuated.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.6.1	---------------------------NOTE------------------------ Only required to be performed in MODE 1. --- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 3.2 μCi/gm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	---------------------------NOTE------------------------ Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR low pressure permissive pressure. --- Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	-------------------------NOTES---------------------- 1. Only required to be performed during RCS heatup and cooldown operations or RCS inservice leak and hydrostatic testing when the vessel pressure is > 313 psig. 2. The limits of Figure 3.4.9-2 may be applied during nonnuclear heatup and ambient loss cooldown associated with inservice leak and hydrostatic testing provided that the heatup and cooldown rates are ≤ 15°F/hour. 3. The limits of Figures 3.4.9-1 and 3.4.9-2 do not apply when the tension from the reactor head flange bolting studs is removed. -- Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-1, Curve No. 3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.5	-------------------------NOTES----------------------- 1. Only required to be performed when tensioning the reactor vessel head bolting studs. 2. The reactor vessel head bolts may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. --	
	Verify reactor vessel flange and head flange temperatures are > 83°F.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.6	-------------------------NOTE------------------------ Not required to be performed until 30 minutes after RCS temperature ≤ 85°F in MODE 4. --	
	Verify reactor vessel flange and head flange temperatures are > 83°F.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.7	-------------------------NOTE------------------------ Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. --	
	Verify reactor vessel flange and head flange temperatures are > 83°F.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify reactor steam dome pressure is $\leq$ 1050 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	-------------------------NOTE------------------------ Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. --- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.4	Verify the LPCI cross tie valve is closed and power is removed from the valve operator.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.8	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.9	-------------------------NOTE------------------------ Vessel injection/spray may be excluded. -- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.10	---------------------------NOTE-------------------------- Valve actuation may be excluded. --- Verify the ADS actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.11	---------------------------NOTE-------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each ADS valve opens when manually actuated.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.12	(Deleted)	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.7	-----------------------------NOTE------------------------ Vessel injection/spray may be excluded. --- Verify the required ECCS injection/spray subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.4	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	---------------------------NOTE--------------------------- Vessel injection may be excluded. --- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute over a 10 minute period at an initial differential pressure of 1 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.1	-------------------------NOTES------------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. --- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	------------------------NOTE------------------------ Not required to be met when the 18 and 20 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. -- Verify each 18 and 20 inch primary containment purge valve is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.2	------------------------NOTES---------------------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for instrument panel valves, vent and drain valves, leak-off lines, and test connection valves. -- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.3	-------------------------NOTES------------------------ 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for vent and drain valves, leak-off lines, and test connection valves. --- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.4.1	Verify drywell average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. --- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.5.2	Perform a functional test of each vacuum breaker.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is $\leq$ 0.5 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. -- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is $\leq$ 0.5 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	In accordance with the Surveillance Frequency Control Program AND 5 minutes when performing testing that adds heat to the suppression pool

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify ≥ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to $\geq$ 0.25 inch of vacuum water gauge in $\leq$ 120 seconds.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.4	Verify two SGT subsystems can maintain $\geq$ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate $\leq$ 12,000 cfm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.2	--------------------------NOTE------------------------- Isolation of flow to individual components does not render EECW System inoperable. ---	
	Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.2	Perform required CREV filter testing in accordance with the VFTP.	In accordance with the VFTP
SR 3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the spent fuel storage pool water level is $\geq$ 21.5 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
SR 3.8.1.1 through SR 3.8.1.9 are applicable to the Unit 1 and 2 AC sources.
SR 3.8.1.10 is applicable only to Unit 3 AC sources.

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	-------------------------NOTES------------------------ 1. Performance of SR 3.8.1.4 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.4 must be met. --- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	-------------------------NOTES------------------------ 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.1 or SR 3.8.1.4. ---	
	Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2295 kW and ≤ 2550 kW.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.4	--------------------------NOTE------------------------- All DG starts may be preceded by an engine prelube period. --- Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3940 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.5	-------------------------NOTE------------------------ If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. --- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; and b. Following load rejection, the steady state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.6	-------------------------NOTE------------------------ All DG starts may be preceded by an engine prelube period followed by a warmup period. --- Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	-------------------------NOTE------------------------ Momentary transients outside the load and power factor ranges do not invalidate this test. --- Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2680 kW and ≤ 2805 kW; and b. For the remaining hours of the test loaded ≥ 2295 kW and ≤ 2550 kW.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	--------------------------NOTE-------------------------- All DG starts may be preceded by an engine prelube period. --- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	For required Unit 3 DGs, the SRs of Unit 3 Technical Specifications are applicable.	In accordance with applicable SRs

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply of fuel.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required DG air start receiver unit pressure is ≥ 165 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	--------------------------NOTE------------------------- Performance of SR 3.8.4.5 satisfies this SR. -- Verify each required battery charger charges its respective battery after the battery's service test.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	--------------------------NOTE------------------------- The modified performance discharge test in SR 3.8.4.4 may be performed in lieu of the service test in SR 3.8.4.3. -- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program <u>AND</u> 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating <u>AND</u> 24 months when battery has reached 85% of expected life with capacity ≥ 100% of manufacturer's rating
SR 3.8.4.5	--------------------------NOTE------------------------- Credit may be taken for unplanned events that satisfy this SR. --- Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for each Unit and Shutdown Board battery (except Shutdown Board battery 3EB), and ≥ 40°F for Shutdown Board battery 3EB and each DG battery.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in refuel position.	In accordance with the Surveillance Frequency Control Program
SR 3.9.2.2	-------------------------NOTE------------------------- Not required to be performed until 1 hour after any control rod is withdrawn. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	-------------------------NOTE------------------------ Not required to be performed until 7 days after the control rod is withdrawn. --- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	In accordance with the Surveillance Frequency Control Program
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.3.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.3.2	--------------------------NOTE------------------------- Not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements. --- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	--------------------------NOTE------------------------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. --- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.4.4	--------------------------NOTE------------------------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. --- Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.6.3	--------------------------NOTE------------------------- Only required to be met during fuel loading. -- Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d and 2.e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.8.2	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.3 satisfied. --- Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 2 of Table 3.3.2.1-1.	 According to the applicable SRs
SR 3.10.8.3	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.2 satisfied. --- Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.	 During control rod movement
SR 3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.8.5	Verify each withdrawn control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position <u>AND</u> Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.8.6	Verify CRD charging water header pressure ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.15 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk- Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

(continued)

Attachment 4.3 to CNL-20-003

Proposed Technical Specification Pages (Unit 3 Re-Typed)
(118 total pages)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	In accordance with the Surveillance Frequency Control Program
SR 3.1.3.2	(Deleted).	
SR 3.1.3.3	--------------------------NOTE-------------------------- Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. -- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 06 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS

---NOTE---
During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown ≥ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.2	Verify continuity of explosive charge.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.3	Verify the SPB concentration is ≥ 8.0% by weight.	In accordance with the Surveillance Frequency Control Program <u>AND</u> Once within 24 hours after water or boron is added to solution
SR 3.1.7.4	Verify the SPB concentration is ≤ 9.2% by weight. <u>OR</u>	In accordance with the Surveillance Frequency Control Program <u>AND</u> Once within 24 hours after water or boron is added to solution (continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
	Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Once within 8 hours after discovery that SPB concentration is > 9.2% by weight <u>AND</u> 12 hours thereafter
SR 3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.6	Verify the SLC conditions satisfy the following equation: $\frac{(\ C\ )(\ Q\ )(\ E\ )}{(8.7 \text{ wt.\%})(50 \text{ gpm})(94 \text{ atom\%})} \geq 1$ where, C = sodium pentaborate solution concentration (weight percent) Q = pump flow rate (gpm) E = Boron-10 enrichment (atom percent Boron-10)	In accordance with the Surveillance Frequency Control Program <u>AND</u> Once within 24 hours after water or boron is added to the solution

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	In accordance with the Surveillance Frequency Control Program
SR 3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	In accordance with the Surveillance Frequency Control Program <u>AND</u> After addition to SLC tank
SR 3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	---------------------------NOTE--------------------------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. --- Verify each SDV vent and drain valve is open.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	In accordance with the Surveillance Frequency Control Program
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after $\geq$ 23% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 23% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 <u>AND</u> Once within 72 hours after each completion of SR 3.1.4.2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after $\geq$ 23% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.2	--------------------------NOTE------------------------- Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. -- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.3	--------------------------NOTE------------------------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.1.5	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.6	-------------------------NOTE------------------------ Only required to be met during entry into MODE 2 from MODE 1. -- Verify the IRM and APRM channels overlap.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.1.7	Calibrate the local power range monitors.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.1.8	(Deleted)	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.9	-------------------------NOTES------------------------ 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.11	(Deleted)	
SR 3.3.1.1.12	(Deleted)	
SR 3.3.1.1.13	-------------------------NOTE------------------------- Neutron detectors are excluded. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.15	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is $\geq$ 26% RTP.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.16	--------------------------NOTE------------------------- For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.17	(Deleted)	

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3[(b)]	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	≥18%[(f)]	3[(b)]	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16	NA
3. Reactor Vessel Steam Dome Pressure - High[(d)]	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3[(d)]	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5[(a)]	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.
(b) Each APRM channel provides inputs to both trip systems.
(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable. Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable. The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.
(f) Following Detect and Suppress Solution – Confirmation Density (DSS-CD) implementation, DSS-CD is not required to be armed while in the DSS-CD Armed Region during the first reactor startup and during the first controlled shutdown that passes completely through the DSS-CD Armed Region. However, DSS-CD is considered OPERABLE and shall be maintained OPERABLE and capable of automatically arming for operation at recirculation drive flow rates above the DSS-CD Armed Region.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High					
b. Float Switch	1,2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
	5(a)	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 46 gallons
8. Turbine Stop Valve - Closure	≥ 26% RTP	4	E	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low(d)	≥ 26% RTP	2	E	SR 3.3.1.1.4 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 550 psig
10. Reactor Mode Switch - Shutdown Position	1,2	1	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
	5(a)	1	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
11. Manual Scram	1,2	1	G	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
	5(a)	1	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA
12. RPS Channel Test Switches	1,2	2	G	SR 3.3.1.1.4	NA
	5(a)	2	H	SR 3.3.1.1.4	NA
13. Deleted					

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(d) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified conditions.

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.2	-------------------------NOTES------------------------ 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. --- Verify an OPERABLE SRM detector is located in: a. The fueled region; b. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region. c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.3	(Deleted)	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.4	--------------------------NOTE------------------------- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. --- Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	12 hours during CORE ALTERATIONS <u>AND</u> In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2.6	--------------------------NOTE------------------------- Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.7	-------------------------NOTES------------------------ 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2(a)	3	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2(b)(c)	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.2	--------------------------NOTE------------------------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.3	--------------------------NOTE------------------------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.4	--------------------------NOTE------------------------- Neutron detectors are excluded. -- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.6	--------------------------NOTE------------------------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. -- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM
SR 3.3.2.1.8	-------------------------NOTE------------------------- Neutron detectors are excluded. -- Verify the RBM: a. Low Power Range -- Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range – Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤ 82% RTP. c. High Power Range -- Upscale Function is not bypassed when THERMAL POWER is > 82% RTP.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.1.2	(Deleted).	
SR 3.3.3.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2.2	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

--NOTE--
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: ≤ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: ≥ 550 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure - High: ≤ 1175 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c and 3.f; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.1.4	(Deleted)	
SR 3.3.5.1.5	(Deleted)	
SR 3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.5.1-1 (page 1 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level — Low Low Low, Level 1[f]	1,2,3	4[b]	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure — High[f]	1,2,3	4[b]	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure — Low (Injection Permissive and ECCS Initiation)[f]	1,2,3	4[b] 2 per trip system	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig
d. Core Spray Pump Discharge Flow — Low (Bypass)	1,2,3	2 1 per subsystem	E	SR 3.3.5.1.2 SR 3.3.5.1.3	≥ 1647 gpm and ≤ 2910 gpm
e. Core Spray Pump Start — Time Delay Relay					
Pumps A,B,C,D (with diesel power)	1,2,3	4 1 per pump	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump A (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds

(continued)

(a) Deleted.

(b) Channels affect Common Accident Signal Logic. Refer to LCO 3.8.1, "AC Sources - Operating."

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 2 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System (continued)					
e. Core Spray Pump Start — Time Delay Relay (continued)					
Pump C (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level — Low Low Low, Level 1[f]	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero
b. Drywell Pressure — High[f]	1,2,3	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Steam Dome Pressure — Low (Injection Permissive and ECCS Initiation)[f]	1,2,3	4	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 435 psig and ≤ 465 psig

(continued)

(a) Deleted.

(b) Deleted.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
d. Reactor Steam Dome Pressure — Low (Recirculation Discharge Valve Permissive)[(f)]	1[(c)],2[(c)], 3[(c)]	4	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 215 psig and ≤ 245 psig
e. Reactor Vessel Water Level — Level 0	1,2,3	2 1 per subsystem	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 312 5/16 inches above vessel zero
f. Low Pressure Coolant Injection Pump Start — Time Delay Relay					
Pump A,B,C,D (with diesel power)	1,2,3	4	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump A (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 0 seconds and ≤ 1 second
Pump B (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 6 seconds and ≤ 8 seconds
Pump C (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 12 seconds and ≤ 16 seconds
Pump D (with normal power)	1,2,3	1	C	SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 18 seconds and ≤ 24 seconds

(continued)

(a) Deleted.

(c) With associated recirculation pump discharge valve open.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 4 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level — Low Low, Level 2[(f)]	1, 2[(d)], 3[(d)]	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 470 inches above vessel zero
b. Drywell Pressure — High[(f)]	1, 2[(d)],3[(d)]	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Reactor Vessel Water Level — High, Level 8	1, 2[(d)], 3[(d)]	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 583 inches above vessel zero
d. Condensate Header Level — Low	1, 2[(d)], 3[(d)]	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ Elev. 551 feet
e. Suppression Pool Water Level — High	1, 2[(d)], 3[(d)]	1	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 7 inches above instrument zero
f. High Pressure Coolant Injection Pump Discharge Flow—Low (Bypass)	1, 2[(d)], 3[(d)]	1	E	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 671 gpm
4. Automatic Depressurization System (ADS) Trip System A					
a. Reactor Vessel Water Level — Low Low Low, Level 1[(f)]	1, 2[(d)], 3[(d)]	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero

(continued)

(d) With reactor steam dome pressure > 150 psig.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 5 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. ADS Trip System A (continued)					
b. Drywell Pressure — High(f)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2(d), 3(d)	1	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level — Low, Level 3 (Confirmatory)(f)	1, 2(d), 3(d)	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure — High	1, 2(d), 3(d)	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure — High	1, 2(d), 3(d)	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2(d), 3(d)	2	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 322 seconds
5. ADS Trip System B					
a. Reactor Vessel Water Level — Low Low Low, Level 1(f)	1, 2(d), 3(d)	2	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 398 inches above vessel zero

(continued)

(d) With reactor steam dome pressure > 150 psig.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

Table 3.3.5.1-1 (page 6 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B (continued)					
b. Drywell Pressure — High[f]	1, 2[d], 3[d]	2	F	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 2.5 psig
c. Automatic Depressurization System Initiation Timer	1, 2[d], 3[d]	1	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 115 seconds
d. Reactor Vessel Water Level — Low, Level 3 (Confirmatory)[f]	1, 2[d], 3[d]	1	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 528 inches above vessel zero
e. Core Spray Pump Discharge Pressure — High	1, 2[d], 3[d]	4	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 175 psig and ≤ 195 psig
f. Low Pressure Coolant Injection Pump Discharge Pressure — High	1, 2[d], 3[d]	8	G	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.6	≥ 90 psig and ≤ 110 psig
g. Automatic Depressurization System High Drywell Pressure Bypass Timer	1, 2[d], 3[d]	2	G	SR 3.3.5.1.3 SR 3.3.5.1.6	≤ 322 seconds

(d) With reactor steam dome pressure > 150 psig.

(f) During instrument calibrations, if the As Found channel setpoint is conservative with respect to the Allowable Value but outside its acceptable As Found band as defined by its associated Surveillance Requirement procedure, then there shall be an initial determination to ensure confidence that the channel can perform as required before returning the channel to service in accordance with the Surveillance. If the As Found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.

Prior to returning a channel to service, the instrument channel setpoint shall be calibrated to a value that is within the acceptable As Left tolerance of the setpoint; otherwise, the channel shall be declared inoperable.

The nominal Trip Setpoint shall be specified on design output documentation which is incorporated by reference in the Updated Final Safety Analysis Report. The methodology used to determine the nominal Trip Setpoint, the predefined As Found Tolerance, and the As Left Tolerance band, and a listing of the setpoint design output documentation shall be specified in Chapter 7 of the Updated Final Safety Analysis Report.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1	Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Declare associated low pressure Emergency Core Cooling System (ECCS) injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---

Refer to Table 3.3.5.2-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.3-1 to determine which SRs apply for each RCIC Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 2 and (b) for up to 6 hours for Function 1 provided the associated Function maintains RCIC initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.3	(Deleted)	
SR 3.3.6.1.4	(Deleted)	
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for performance of a CHANNEL CALIBRATION or maintenance, entry into associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the tripped condition.

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each CREV Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains CREV initiation capability.

3. For Functions 3 and 4, when a channel is placed in an inoperable status solely for the performance of a CHANNEL CALIBRATION or maintenance, entry into the associated Conditions and Required Actions may be delayed for up to 24 hours provided the downscale trip of the inoperable channel is placed in the trip condition.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Ventilation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low, Level 3	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≥ 528 inches above vessel zero
2. Drywell Pressure - High	1,2,3	2	B	SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 2.5 psig
3. Reactor Zone Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 100 mR/hr
4. Refueling Floor Exhaust Radiation - High	1,2,3	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 100 mR/hr
5. Control Room Air Supply Duct Radiation - High	1,2,3	1	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.3 SR 3.3.7.1.4	≤ 270 cpm above background

SURVEILLANCE REQUIREMENTS

---NOTE---

Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.1.2	(Deleted)	
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BOARD	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Shutdown Board Undervoltage (Loss of Voltage)			
a. Board Undervoltage	2	SR 3.3.8.1.1 SR 3.3.8.1.3	Reset at ≥ 2813 V and ≤ 2927 V
b. Diesel Start Initiation Time Delay	2	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 1.4 seconds and ≤ 1.6 seconds
2. 4.16 kV Shutdown Board Undervoltage (Degraded Voltage)			
a. Board Undervoltage	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3900 V and ≤ 3940 V
b.1 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 0.2 seconds and ≤ 0.4 seconds
b.2 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 3 seconds and ≤ 5 seconds
b.3 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 5.15 seconds and ≤ 8.65 seconds
b.4 Time Delay	1	SR 3.3.8.1.1 SR 3.3.8.1.3	≥ 0.9 seconds and ≤ 1.7 seconds
3. 4.16 kV Shutdown Board Undervoltage (Unbalanced Voltage Relay)	3	SR 3.3.8.1.1 SR 3.3.8.1.3	≤ 1.5V at 3 seconds (Permissive Alarm) ≤ 3.4V at 8.65 seconds (Lo) ≤ 20V at 3.5 seconds (High)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2.3	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	-------------------------NOTE------------------------ Not required to be performed until 24 hours after both recirculation loops are in operation. -- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	---------------------------NOTES---------------------- 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 23% RTP. --	
	Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	---------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify each required S/RV opens when manually actuated.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	---------------------------NOTE------------------------ Only required to be performed in MODE 1. -- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is $\leq$ 3.2 μCi/gm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	---------------------------NOTE------------------------ Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR low pressure permissive pressure. -- Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	-------------------------NOTES---------------------- 1. Only required to be performed during RCS heatup and cooldown operations or RCS inservice leak and hydrostatic testing when the vessel pressure is > 313 psig. 2. The limits of Figure 3.4.9-2 may be applied during nonnuclear heatup and ambient loss cooldown associated with inservice leak and hydrostatic testing provided that the heatup and cooldown rates are ≤ 15°F/hour. 3. The limits of Figures 3.4.9-1 and 3.4.9-2 do not apply when the tension from the reactor head flange bolting studs is removed. --- Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-1, Curve No. 3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.5	--------------------------NOTES----------------------- 1. Only required to be performed when tensioning the reactor vessel head bolting studs. 2. The reactor vessel head bolts may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.6	--------------------------NOTE------------------------ Not required to be performed until 30 minutes after RCS temperature ≤ 85°F in MODE 4. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.7	--------------------------NOTE------------------------ Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. --- Verify reactor vessel flange and head flange temperatures are > 83°F.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify reactor steam dome pressure is ≤ 1050 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	-------------------------NOTE------------------------ Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) low pressure permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. --- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.4	Verify the LPCI cross tie valve is closed and power is removed from the valve operator. or Verify the manual shutoff valve in the LPCI cross tie is closed.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	------NOTE------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ------------ Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.8	------NOTE------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ------------ Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.9	------NOTE------ Vessel injection/spray may be excluded. ------------ Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.10	-------------------------NOTE------------------------ Valve actuation may be excluded. --- Verify the ADS actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.11	-------------------------NOTE------------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --- Verify each ADS valve opens when manually actuated.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.12	(Deleted)	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify for the required ECCS injection/spray subsystem each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.7	-----------------------------NOTE------------------------ Vessel injection/spray may be excluded. --- Verify the required ECCS injection/spray subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	--------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --	
	Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.4	--------------------------NOTE------------------------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. --	
	Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	--------------------------NOTE-------------------------- Vessel injection may be excluded. -- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute over a 10 minute period at an initial differential pressure of 1 psid.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.1	-------------------------NOTES------------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. --- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	-------------------------NOTE------------------------ Not required to be met when the 18 and 20 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. --- Verify each 18 and 20 inch primary containment purge valve is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.2	-------------------------NOTES----------------------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for instrument panel valves, vent and drain valves, leak-off lines, and test connection valves. --- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.3	-------------------------NOTES------------------------ 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. 3. Not required to be performed for vent and drain valves, leak-off lines, and test connection valves. --	
	Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is $\geq$ 3 seconds and $\leq$ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.10	Verify leakage rate through each MSIV is $\leq$ 100 scfh and that the combined leakage rate for all four main steam lines is $\leq$ 150 scfh when tested at $\geq$ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.4.1	Verify drywell average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. --- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.5.2	Perform a functional test of each vacuum breaker.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is $\leq$ 0.5 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	-------------------------NOTES------------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. -- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	In accordance with the Surveillance Frequency Control Program <u>AND</u> 5 minutes when performing testing that adds heat to the suppression pool

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify ≥ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 120 seconds.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.1.4	Verify two SGT subsystems can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate ≤ 12,000 cfm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.2	-------------------------NOTE------------------------ Isolation of flow to individual components does not render EECW System inoperable. --- Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.2	Perform required CREV filter testing in accordance with the VFTP.	In accordance with the VFTP
SR 3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the spent fuel storage pool water level is ≥ 21.5 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

---NOTE---
SR 3.8.1.1 through SR 3.8.1.9 are applicable to the Unit 3 AC sources. SR 3.8.1.10 is applicable only to Unit 1 and 2 AC sources.

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	-------------------------NOTES------------------------ 1. Performance of SR 3.8.1.4 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.4 must be met. --- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	 In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	-------------------------NOTES------------------------ 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.1 or SR 3.8.1.4. -- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2295 kW and ≤ 2550 kW.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.4	--------------------------NOTE------------------------ All DG starts may be preceded by an engine prelube period. --- Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3940 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.5	--------------------------NOTE------------------------- If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. -- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; and b. Following load rejection, the steady state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.6	--------------------------NOTE------------------------- All DG starts may be preceded by an engine prelube period followed by a warmup period. -- Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	--------------------------NOTE------------------------- Momentary transients outside the load and power factor ranges do not invalidate this test. --- Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2680 kW and ≤ 2805 kW; and b. For the remaining hours of the test loaded ≥ 2295 kW and ≤ 2550 kW.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	------------------------NOTE------------------------ All DG starts may be preceded by an engine prelube period. --- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	For required Unit 1 and 2 DGs, the SRs of Unit 1 and 2 Technical Specifications are applicable.	In accordance with applicable SRs

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply of fuel.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required DG air start receiver unit pressure is ≥ 165 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	-------------------------NOTE------------------------ Performance of SR 3.8.4.5 satisfies this SR. ---	
	Verify each required battery charger charges its respective battery after the battery's service test.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	-------------------------NOTE------------------------ The modified performance discharge test in SR 3.8.4.4 may be performed in lieu of the service test in SR 3.8.4.3. ---	
	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program <u>AND</u> 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating <u>AND</u> 24 months when battery has reached 85% of expected life with capacity ≥ 100% of manufacturer's rating
SR 3.8.4.5	--------------------------NOTE-------------------------- Credit may be taken for unplanned events that satisfy this SR. -- Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for each Unit and Shutdown Board battery (except Shutdown Board battery 3EB), and ≥ 40°F for Shutdown Board battery 3EB and each DG battery.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in refuel position.	In accordance with the Surveillance Frequency Control Program
SR 3.9.2.2	--------------------------NOTE------------------------- Not required to be performed until 1 hour after any control rod is withdrawn. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	-------------------------NOTE------------------------ Not required to be performed until 7 days after the control rod is withdrawn. --- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is $\geq$ 940 psig.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	In accordance with the Surveillance Frequency Control Program
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.3.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.3.2	--------------------------NOTE------------------------- Not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements. -- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	 In accordance with the Surveillance Frequency Control Program
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	-------------------------NOTE------------------------ Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. --- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	 In accordance with the Surveillance Frequency Control Program
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.4.4	-------------------------NOTE------------------------ Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. --- Verify a control rod withdrawal block is inserted.	 In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	In accordance with the Surveillance Frequency Control Program
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	In accordance with the Surveillance Frequency Control Program
SR 3.10.6.3	--------------------------NOTE------------------------- Only required to be met during fuel loading. --- Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d and 2.e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.8.2	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.3 satisfied. --- Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 2 of Table 3.3.2.1-1.	 According to the applicable SRs
SR 3.10.8.3	-------------------------NOTE------------------------ Not required to be met if SR 3.10.8.2 satisfied. --- Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.	 During control rod movement
SR 3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.8.5	Verify each withdrawn control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position <u>AND</u> Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.8.6	Verify CRD charging water header pressure ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.14 Residual Heat Removal (RHR) Heat Exchanger Performance Monitoring Program

This program is established to ensure that the RHR heat exchangers are maintained in a condition that meets or exceeds the minimum performance capability assumed in containment analyses, which support not taking credit for containment accident pressure in the NPSH analyses. The RHR heat exchanger testing and determination of overall uncertainty in the fouling resistance shall be in accordance with the guidelines in EPRI report, EPRI 3002005340, Service Water Heat Exchanger Test Guidelines, May 2015. This program establishes the following attributes.

a. The program establishes provisions to periodically monitor RHR heat exchanger thermal performance. The program includes frequency of monitoring and the methodology considers uncertainty of the result.

b. The program establishes and controls acceptance criteria for RHR heat exchanger worst fouling resistance and number of plugged tubes.

c. The program establishes limitations and allows for compensatory actions if degraded performance is observed.

d. Changes to the program shall be made under appropriate administrative review.

e. Details of the program including program limitations, compensatory actions for degraded performance, testing method, data acquisition method, data reduction method, overall uncertainty determination method, thermal performance analysis, acceptance criteria, and computer programs used that meet the 10 CFR 50 Appendix B, and 10 CFR 21 requirements are described in the UFSAR.

5.5.15 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

5.5 Programs and Manuals

5.5.15 Surveillance Frequency Control Program (continued)

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in the accordance with NEI 04-10, “Risk-Informed Method for Control of Surveillance Frequencies,” Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

Attachment 5 to CNL-20-003

Proposed Technical Specification Bases Changes
(BFN Unit 1 - Information Only)
(174 total pages)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

The position of each control rod must be determined to ensure adequate information on control rod position is available to the operator for determining control rod OPERABILITY and controlling rod patterns. Control rod position may be determined by the use of OPERABLE position indicators, by moving control rods to a position with an OPERABLE indicator, or by the use of other appropriate methods. ~~The 24 hour Frequency of this SR is based on operating experience related to expected changes in control rod position and the availability of control rod position indications in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.3.2

(Deleted).

SR 3.1.3.3

Control rod insertion capability is demonstrated by inserting each partially or fully withdrawn control rod at least one notch and observing that the control rod moves. The control rod may then be returned to its original position. This ensures the control rod is not stuck and is free to insert on a scram signal. This surveillance is not required when THERMAL POWER is less than or equal to the actual LPSP of the RWM, since the notch insertions may not be compatible with the requirements of banked position withdrawal sequence (BPWS) (LCO 3.1.6) and the RWM (LCO 3.3.2.1). ~~The 31 day Frequency takes into account operating experience related to changes in CRD performance. At any time, if a control rod is immovable, a determination of that control rod's trippability must be made and appropriate action taken.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. This sample remains representative if no more than 7.5% of the control rods in the sample tested are determined to be "slow." With more than 7.5% of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 7.5% criterion (i.e., 7.5% of the entire sample) is satisfied, or until the total number of "slow" control rods (throughout the core from all Surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. ~~The 200 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

SR 3.1.5.1 requires that the accumulator pressure be checked ~~every 7 days~~periodically to ensure adequate accumulator pressure exists to provide sufficient scram force. An automatic accumulator monitor may be used to continuously satisfy this requirement. The primary indicator of accumulator OPERABILITY is the accumulator pressure. A minimum accumulator pressure is specified, below which the capability of the accumulator to perform its intended function becomes degraded and the accumulator is considered inoperable. The minimum accumulator pressure of 940 psig is well below the expected pressure of 1100 psig (Ref. 1). Declaring the accumulator inoperable when the minimum pressure is not maintained ensures that significant degradation in scram times does not occur. ~~The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 3.4.6.
2. FSAR, Section 14.5.
3. FSAR, Section 14.6.
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

ACTIONS

B.1 and B.2 (continued)

LCO 3.3.2.1 requires verification of control rod movement by a second licensed operator or a qualified member of the technical staff.

When nine or more OPERABLE control rods are not in compliance with BPWS, the reactor mode switch must be placed in the shutdown position within 1 hour. With the mode switch in shutdown, the reactor is shut down, and as such, does not meet the applicability requirements of this LCO. The allowed Completion Time of 1 hour is reasonable to allow insertion of control rods to restore compliance, and is appropriate relative to the low probability of a CRDA occurring with the control rods out of sequence.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

The control rod pattern is periodically verified to be in compliance with the BPWS ~~at a 24 hour Frequency~~ to ensure the assumptions of the CRDA analyses are met. ~~The 24 hour Frequency was developed considering that the primary check on compliance with the BPWS is performed by the RWM (LCO 3.3.2.1),~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The RWM~~which~~ provides control rod blocks to enforce the required sequence and is required to be OPERABLE when operating at $\leq$ 10% RTP.

(continued)

BASES

ACTIONS (continued)

B.1

If both SLC subsystems are inoperable, at least one subsystem must be restored to OPERABLE status within 8 hours. The allowed Completion Time of 8 hours is considered acceptable given the low probability of a DBA or transient occurring concurrent with the failure of the control rods to shut down the reactor.

C.1 and C.2

If any Required Action and associated Completion Time is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

SR 3.1.7.1 ~~is a 24 hour Surveillance~~ verifies~~ying~~ the volume of the borated solution in the storage tank, thereby ensuring SLC System OPERABILITY without disturbing normal plant operation. This Surveillance ensures that the proper borated solution volume is maintained for reactivity control and post-LOCA suppression pool pH control. The tank volume requirement of 4000 gallons is established by the amount of boron at 8.0% by weight concentration required for the radiological dose analysis for post-LOCA suppression pool pH control. The tank volume requirement for reactivity control is encompassed by the requirement for post LOCA pH control. For reactivity control, the sodium

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1 (continued)

pentaborate solution concentration requirements (≤ 9.2% by weight) and the required quantity of Boron-10 (≥ 203 lbs) establish the tank volume requirement. ~~The 24 hour Frequency is based on operating experience that has shown there are relatively slow variations in the solution volume.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.7.2

SR 3.1.7.2 verifies the continuity of the explosive charges in the injection valves to ensure that proper operation will occur if required. An automatic continuity monitor may be used to continuously satisfy this requirement. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. ~~The 31 day Frequency is based on operating experience and has demonstrated the reliability of the explosive charge continuity.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.7.3

SR 3.1.7.3 requires an examination of sodium pentaborate solution by using chemical analysis to ensure that the proper concentration of boron exists in the storage tank for post-LOCA suppression pool pH control. This parameter is used as input to determine the volume requirements for SR 3.1.7.1. The concentration is dependent upon the volume of water and quantity of boron in the storage tank.

(continued)

SR 3.1.7.3 must be performed ~~every 31 days~~ according to the Surveillance Frequency Control Program or within 24 hours of when boron or water is added to the storage tank solution to determine that the boron solution concentration is within the specified limits. ~~The 31 day Frequency of this Surveillance is appropriate because of the relatively slow variation of boron concentration between surveillances.~~

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.7.4 and SR 3.1.7.6 (continued)

to be within the limits of Figure 3.1.7-1. This ensures that unwanted precipitation of the sodium pentaborate does not occur.

SR 3.1.7.4 and SR 3.1.7.6 must be performed ~~every 31 days~~according to the Surveillance Frequency Control Program or within 24 hours of when boron or water is added to the storage tank solution to determine that the boron solution concentration is within the specified limits. ~~The 31 day Frequency of these Surveillances is appropriate because of the relatively slow variation of boron concentration between surveillances.~~

SR 3.1.7.4 must be performed within 8 hours of discovery that the concentration is > 9.2 weight percent and every 12 hours thereafter until the concentration is verified to be ≤ 9.2 weight percent. This Frequency is appropriate under these conditions taking into consideration the SLC System design capability still exists for vessel injection under these conditions and the low probability of the temperature and concentration limits of Figure 3.1.7-1 not being met.

SR 3.1.7.5

This Surveillance requires the amount of Boron-10 in the SLC solution tank to be determined ~~every 31 days~~ periodically. The enriched sodium pentaborate solution is made by combining stoichiometric quantities of borax and boric acid in demineralized water. Since the chemicals used have known Boron-10 quantities, the Boron-10 quantity in the sodium pentaborate solution formed can be calculated. This parameter is used as input to determine the volume requirements for reactivity control encompassed by SR 3.1.7.1. ~~The 31 day Frequency of this Surveillance is appropriate because of the relatively slow variation of boron concentration between~~

(continued)

~~surveillances.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.7.7

Demonstrating that each SLC System pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig ensures that pump performance has not degraded during the fuel cycle. This minimum pump flow rate requirement ensures that, when combined with the sodium pentaborate solution concentration and enrichment requirements, the rate of negative reactivity insertion from the SLC System will adequately compensate for the positive reactivity effects encountered during power reduction, cooldown of the moderator, and xenon decay. This test confirms one point on the pump design curve and is indicative of overall performance. ~~The 24 month Frequency is acceptable since inservice testing of the pumps, performed every 92 days, will detect any adverse trends in pump performance.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.7.8 and SR 3.1.7.9

These Surveillances ensure that there is a functioning flow path from the boron solution storage tank to the RPV, including the firing of an explosive valve. The replacement charge for the explosive valve shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of that batch successfully fired. Additionally, replacement charges shall be selected such that the age of charge in service shall not exceed five years from the manufacturer's assembly date. ~~The pump and explosive valve tested should be alternated such that both complete flow paths are tested every 48 months at alternating 24 month intervals.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.7.8 and SR 3.1.7.9 (continued)

The Surveillance may be performed in separate steps to prevent injecting boron into the RPV. An acceptable method for verifying flow from the pump to the RPV is to pump demineralized water from a test tank through one SLC subsystem and into the RPV. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Demonstrating that all piping between the boron solution storage tank and the suction inlet to the injection pumps is unblocked ensures that there is a functioning flow path for injecting the sodium pentaborate solution. An acceptable method for verifying that the suction piping is unblocked is to pump from the storage tank to the storage tank. ~~The 24 month Frequency is acceptable since there is a low probability that the subject piping will be blocked due to precipitation of the boron from solution in the piping or by other means.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.7.10

The enriched sodium pentaborate solution is made by combining stoichiometric quantities of borax and boric acid in demineralized water. Isotopic tests on these chemicals to verify the actual B-10 enrichment must be performed ~~at least every 24 months~~according to the Surveillance Frequency Control Program and after addition of boron to the SLC tank in order to ensure that the proper B-10 atom percentage is being used and

(continued)

SR 3.1.7.6 will be met. The sodium pentaborate enrichment must be calculated within 24 hours and verified by analysis within 30 days.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)	SR 3.1.7.11 SR 3.1.7.11 verifies that each valve in the system is in its correct position, but does not apply to the squib (i.e., explosive) valves. Verifying the correct alignment for manual, power operated, and automatic valves in the SLC System Flowpath provides assurance that the proper flow paths will exist for system operation. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position from the control room, or locally by a dedicated operator at the valve control. This is acceptable since the SLC System is a manually initiated system. This surveillance also does not apply to valves that are locked, sealed, or otherwise secured in position since they are verified to be in the correct position prior to locking, sealing or securing. This verification of valve alignment does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. ~~The 31 day Frequency is based on engineering judgment and is consistent with the procedural controls governing valve operation that ensures correct valve positions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.62.
2. NEDC-33860P, “Safety Analysis Report for Browns Ferry Nuclear Plant Units 1, 2, and 3 Extended Power Uprate,” Section 2.8.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
4. FSAR, Section 14.6.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

During normal operation, the SDV vent and drain valves should be in the open position (except when performing SR 3.1.8.2) to allow for drainage of the SDV piping. Verifying that each valve is in the open position ensures that the SDV vent and drain valves will perform their intended functions during normal operation. This SR does not require any testing or valve manipulation; rather, it involves verification that the valves are in the correct position.

~~The 31 day Frequency is based on engineering judgment and is consistent with the procedural controls governing valve operation, which ensure correct valve positions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.8.2

During a scram, the SDV vent and drain valves should close to contain the reactor water discharged to the SDV piping. Cycling each valve through its complete range of motion (closed and open) ensures that the valve will function properly during a scram. ~~The 92 day Frequency is based on operating experience and takes into account the level of redundancy in the system design.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.8.3

SR 3.1.8.3 is an integrated test of the SDV vent and drain valves to verify total system performance. After receipt of a simulated or actual scram signal, the closure of the SDV vent and drain valves is verified. The closure time of 60 seconds after receipt of a scram signal is acceptable based on the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.3 (continued)

bounding analysis for release of reactor coolant outside containment (Ref. 2). Similarly, after receipt of a simulated or actual scram reset signal, the opening of the SDV vent and drain valves is verified. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1 and the scram time testing of control rods in LCO 3.1.3 overlap this Surveillance to provide complete testing of the assumed safety function. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 3.4.5.3.1.
2. FSAR, Section 14.6.5.
3. 10 CFR 50.67.
4. FSAR, Section 6.5.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS

A.1

If any APLHGR exceeds the required limits, an assumption regarding an initial condition of the DBA and transient analyses may not be met. Therefore, prompt action should be taken to restore the APLHGR(s) to within the required limits such that the plant operates within analyzed conditions and within design limits of the fuel rods. The 2 hour Completion Time is sufficient to restore the APLHGR(s) to within its limits and is acceptable based on the low probability of a transient or DBA occurring simultaneously with the APLHGR out of specification.

B.1

If the APLHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 23% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 23% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

APLHGRs are required to be initially calculated within 12 hours after THERMAL POWER is ≥ 23% RTP and periodically~~then every 24 hours~~ thereafter. They are compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. ~~The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation.~~ The 12 hour allowance after THERMAL POWER ≥ 23% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS

A.1 (continued)

analyses may not be met. Therefore, prompt action should be taken to restore the MCPR(s) to within the required limits such that the plant remains operating within analyzed conditions. The 2 hour Completion Time is normally sufficient to restore the MCPR(s) to within its limits and is acceptable based on the low probability of a transient or DBA occurring simultaneously with the MCPR out of specification.

B.1

If the MCPR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 23% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 23% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

The MCPR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 23% RTP and then periodically~~every 24 hours~~ thereafter. It is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. ~~The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation.~~ The 12 hour allowance after THERMAL POWER ≥ 23% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

ACTIONS

A.1

If any LHGR exceeds its required limit, an assumption regarding an initial condition of the fuel design analysis is not met. Therefore, prompt action should be taken to restore the LHGR(s) to within its required limits such that the plant is operating within analyzed conditions. The 2 hour Completion Time is normally sufficient to restore the LHGR(s) to within its limits and is acceptable based on the low probability of a transient or Design Basis Accident occurring simultaneously with the LHGR out of specification.

B.1

If the LHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER is reduced to < 23% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER TO < 23% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

The LHGR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 23% RTP and then periodically~~every 24 hours~~ thereafter. It is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. ~~The 24 hour Frequency is based on both engineering judgment and recognition of the slow changes in power distribution during normal operation.~~ The 12 hour allowance after THERMAL POWER ≥ 23% RTP is achieved is acceptable given the large inherent margin to operating limits at lower power levels. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

11. Manual Scram (continued)

Two channels of Manual Scram with one channel in each manual scram trip system are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

12. RPS Channel Test Switches

There are four RPS Channel Test Switches, one associated with each of the four automatic scram logic channels (A1, A2, B1, and B2). These keylock switches allow the operator to test the OPERABILITY of each individual logic channel without the necessity of using a scram function trip. When the RPS Channel Test Switch is placed in test, the associated scram logic channel is deenergized and OPERABILITY of the channel's scram contactors can be confirmed. The RPS Channel Test Switches are not specifically credited in the accident analysis. However, because the Manual Scram Function at Browns Ferry Nuclear Plant is not configured the same as the generic model in Reference 9, the RPS Channel Test Switches are included in the analysis in Reference 11. ~~Reference 11 concludes that the Surveillance Frequency extensions for RPS functions, described in Reference 9, are not affected by the difference in configuration since each automatic RPS channel has a test switch which is functionally the same as the manual scram switches in the generic model. Weekly testing of scram contactors is credited in Reference 9 with supporting the Surveillance Frequency extension of the RPS functions.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency is based upon operating experience that demonstrates channel failure is rare.~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance. ~~The Frequency of once per 7 days is based on minor changes in LPRM sensitivity, which could affect the APRM reading, between performances of SR 3.3.1.1.7.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

A restriction to satisfying this SR when < 25% RTP is provided that requires the SR to be met only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 25% RTP. At low power levels, a high degree of accuracy is unnecessary because of the large, inherent margin to thermal limits (MCPR and APLHGR). At ≥ 25% RTP, the Surveillance is required to have been satisfactorily performed ~~within the last 7 days~~, in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 25% if the ~~7 day~~ Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 25% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.3

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

As noted, SR 3.3.1.1.3 is not required to be performed when entering MODE 2 from MODE 1, since testing of the MODE 2 required IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This allows entry into MODE 2 if the ~~7 day~~ Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after entering MODE 2 from MODE 1. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

~~A Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval and is based on reliability analysis (Ref. 9).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. ~~A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on the reliability analysis of Reference 9. (The RPS Channel Test Switch Function's CHANNEL FUNCTIONAL TEST Frequency was credited in the analysis to extend many automatic scram Functions' Frequencies.)~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.5 and SR 3.3.1.1.6 (continued)

If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channel(s) declared inoperable. Only those appropriate channels that are required in the current MODE or condition should be declared inoperable.

~~A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.7

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. ~~The 1000 MWD/T average core exposure Frequency is based on operating experience with LPRM sensitivity changes.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.8 and SR 3.3.1.12

Deleted.

~~SR 3.3.1.1.8, SR 3.3.1.1.12, and~~ SR 3.3.1.1.16

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific

(continued)

BASES

SURVEILLANCE REQUIREMENTS

~~SR 3.3.1.1.8, SR 3.3.1.1.12, and~~ SR 3.3.1.1.16 (continued)

setpoint methodology. ~~The 92 day Frequency of SR 3.3.1.1.8 is based on the reliability analysis of Reference 9.~~

The ~~184 day frequency of~~ SR 3.3.1.1.16 ~~for the APRM Functions supplements the automatic self-test functions that operate continuously in the APRM and voter channels.~~ Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The APRM CHANNEL FUNCTIONAL TEST covers the APRM channels (including recirculation flow processing – applicable to Function 2.b, only), the 2-out-of-4 voter channels, and the interface connections into the RPS trip systems from the voter channels. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. ~~The 184 day Frequency of SR 3.3.1.1.16 for the APRM Functions is based on the reliability analysis of Reference 2.~~ (NOTE: The actual voting logic of the 2-out-of-4 Voter Function is tested as part of SR 3.3.1.1.14.) A Note for SR 3.3.1.1.16 is provided that requires the APRM Function 2.a SR to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM Function cannot be performed in MODE 1 without utilizing jumpers or lifted leads. This Note allows entry into MODE 2 from MODE 1 if the associated frequency is not met per SR 3.0.2. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

~~The 24 month Frequency of SR 3.3.1.1.12 is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.9, SR 3.3.1.1.10 and SR 3.3.1.1.13 (continued)

~~The Frequency of SR 3.3.1.1.9 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.1.1.10 is based upon the assumption of a 184 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.1.1.13 is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequencies are controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.11

(Deleted).

SR 3.3.1.1.14

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods (LCO 3.1.3), and SDV vent and drain valves (LCO 3.1.8), overlaps this Surveillance to provide complete testing of the assumed safety function.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.15

This SR ensures that scrams initiated from the Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 30% RTP. This involves calibration of the bypass channels (PIS-1-81A, PIS-1-81B, PIS-1-91A, and PIS-1-91B). Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint.

If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 30% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition (Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are enabled), this SR is met and the channel is considered OPERABLE.

~~The Frequency of 24 months is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

With one or more required SRM inoperable in MODE 5, the ability to detect local reactivity changes in the core during refueling is degraded. CORE ALTERATIONS must be immediately suspended and action must be immediately initiated to insert all insertable control rods in core cells containing one or more fuel assemblies. Suspending CORE ALTERATIONS prevents the two most probable causes of reactivity changes, fuel loading and control rod withdrawal, from occurring. Inserting all insertable control rods ensures that the reactor will be at its minimum reactivity given that fuel is present in the core. Suspension of CORE ALTERATIONS shall not preclude completion of the movement of a component to a safe, conservative position.

Action (once required to be initiated) to insert control rods must continue until all insertable rods in core cells containing one or more fuel assemblies are inserted.

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each SRM Applicable MODE or other specified conditions are found in the SRs column of Table 3.3.1.2-1.

SR 3.3.1.2.1 ~~and SR 3.3.1.2.3~~

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on another channel. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.1 ~~and SR 3.3.1.2.3~~ (continued)

Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency of once every 12 hours for SR 3.3.1.2.1 is based on operating experience that demonstrates channel failure is rare. While in MODES 3 and 4, reactivity changes are not expected; therefore, the 12 hour Frequency is relaxed to 24 hours for SR 3.3.1.2.3.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.2.2

To provide adequate coverage of potential reactivity changes in the core when the fueled region encompasses more than one SRM, one SRM is required to be OPERABLE in the quadrant where CORE ALTERATIONS are being performed, and the other OPERABLE SRM must be in an adjacent quadrant

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.2 (continued)

containing fuel. Note 1 states that the SR is required to be met only during CORE ALTERATIONS. It is not required to be met at other times in MODE 5 since core reactivity changes are not occurring. This Surveillance consists of a review of plant logs to ensure that SRMs required to be OPERABLE for given CORE ALTERATIONS are, in fact, OPERABLE. In the event that only one SRM is required to be OPERABLE (when the fueled region encompasses only one SRM), per Table 3.3.1.2-1, footnote (b), only the a. portion of this SR is required. Note 2 clarifies that more than one of the three requirements can be met by the same OPERABLE SRM. ~~The 12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities that include steps to ensure that the SRMs required by the LCO are in the proper quadrant.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.2.3

Deleted.

SR 3.3.1.2.4

This Surveillance consists of a verification of the SRM instrument readout to ensure that the SRM reading is greater than a specified minimum count rate, which ensures that the detectors are indicating count rates indicative of neutron flux levels within the core. With few fuel assemblies loaded, the SRMs will not have a high enough count rate to satisfy the SR. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the minimum count rate.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.4 (continued)

To accomplish this, the SR is modified by a Note that states that the count rate is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated core quadrant, even with a control rod withdrawn, the configuration will not be critical.

~~The Frequency is based upon channel redundancy and other information available in the control room, and ensures that the required channels are frequently monitored while core reactivity changes are occurring. When no reactivity changes are in progress, the Frequency is relaxed from 12 hours to 24 hours.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.2.5 and SR 3.3.1.2.6

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated channel will function properly. SR 3.3.1.2.5 is required in MODE 5, and ~~the 7 day Frequency~~ ensures that the channels are OPERABLE while core reactivity changes could be in progress. ~~This Frequency is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK), that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.5 and SR 3.3.1.2.6 (continued)

SR 3.3.1.2.6 is required in MODE 2 with IRMs on Range 2 or below, and in MODES 3 and 4. ~~Since core reactivity changes do not normally take place in MODES 3 and 4 and core reactivity changes are due mainly to control rod movement in MODE 2, the Frequency has been extended from 7 days to 31 days. The 31 day Frequency is based on operating experience and on other Surveillances (such as CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Verification of the signal to noise ratio also ensures that the detectors are inserted to an acceptable operating level. In a fully withdrawn condition, the detectors are sufficiently removed from the fueled region of the core to essentially eliminate neutrons from reaching the detector. Any count rate obtained while the detectors are fully withdrawn is assumed to be "noise" only.

The Note to SR 3.3.1.2.6 allows the Surveillance to be delayed until entry into the specified condition of the Applicability (THERMAL POWER decreased to IRM Range 2 or below). The SR must be performed within 12 hours after IRMs are on Range 2 or below. The allowance to enter the Applicability with the ~~31 day~~ Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour allowance is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.7

Performance of a CHANNEL CALIBRATION ~~at a Frequency of 92 days~~ verifies the performance of the SRM detectors and associated circuitry. The Frequency considers the plant conditions required to perform the test, the ease of performing the test, and the likelihood of a change in the system or component status. The neutron detectors are excluded from the CHANNEL CALIBRATION (Note 1) because they cannot readily be adjusted. The detectors are fission chambers that are designed to have a relatively constant sensitivity over the range and with an accuracy specified for a fixed useful life. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the ~~92 day~~ Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour allowance is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

REFERENCES

1. FSAR, Section 7.5.4.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 9) assumption of the average time required to perform a channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a control rod block will be initiated when necessary.

SR 3.3.2.1.1

A CHANNEL FUNCTIONAL TEST is performed for each RBM channel to ensure that the entire channel will perform the intended function. It includes the Reactor Manual Control System input.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. ~~The Frequency of 184 days is based on reliability analyses (Ref. 11).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.1.2 and SR 3.3.2.1.3

A CHANNEL FUNCTIONAL TEST is performed for the RWM to ensure that the entire system will perform the intended function. The CHANNEL FUNCTIONAL TEST for the RWM is performed by attempting to withdraw a control rod not in compliance with the prescribed sequence and verifying a control rod block occurs. This test is performed as soon as possible after the applicable conditions are entered. As noted in the SRs, SR 3.3.2.1.2 is not required to be performed until 1 hour after

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.2 and SR 3.3.2.1.3 (continued)

any control rod is withdrawn at ≤ 10% RTP in MODE 2. As noted, SR 3.3.2.1.3 is not required to be performed until 1 hour after THERMAL POWER is reduced to ≤ 10% RTP in MODE 1. This allows entry into MODE 2 for SR 3.3.2.1.2, and THERMAL POWER reduction to ≤ 10% RTP for SR 3.3.2.1.3, to perform the required Surveillance if the ~~92 day~~ Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs. ~~The Frequencies are based on reliability analysis (Ref. 8).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.1.4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

As noted, neutron detectors are excluded from the CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.7.

~~The Frequency is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.5

The RWM is automatically bypassed when power is above a specified value. The power level is determined from feedwater flow and steam flow signals. The automatic bypass setpoint must be verified periodically to be > 10% RTP. If the RWM low power setpoint is nonconservative, then the RWM is considered inoperable. Alternately, the low power setpoint channel can be placed in the conservative condition (nonbypass). If placed in the nonbypassed condition, the SR is met and the RWM is not considered inoperable. ~~The Frequency is based on the trip setpoint methodology utilized for the low power setpoint channel.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.1.6

A CHANNEL FUNCTIONAL TEST is performed for the Reactor Mode Switch - Shutdown Position Function to ensure that the entire channel will perform the intended function. The CHANNEL FUNCTIONAL TEST for the Reactor Mode Switch - Shutdown Position Function is performed by attempting to withdraw any control rod with the reactor mode switch in the shutdown position and verifying a control rod block occurs.

As noted in the SR, the Surveillance is not required to be performed until 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable links. This allows entry into MODES 3 and 4 if the ~~24 month~~ Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.6 (continued)

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.1.7

The RWM will only enforce the proper control rod sequence if the rod sequence is properly input into the RWM computer. This SR ensures that the proper sequence is loaded into the RWM so that it can perform its intended function. The Surveillance is performed once prior to declaring RWM OPERABLE following loading of sequence into RWM, since this is when rod sequence input errors are possible.

SR 3.3.2.1.8

The RBM Setpoints are automatically varied as a function of power. Three Allowable Values are specified in the COLR, each within a specific power range. The powers at which the control rod block Allowable Values automatically change are based on the APRM signal's input to each RBM channel. Below the minimum power setpoint, the RBM is automatically bypassed. These power Allowable Values must be verified periodically to be less than or equal to the specified values. If any power range setpoint is nonconservative, then the affected RBM channel is considered inoperable. Alternatively, the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.8 (continued)

power range channel can be placed in the conservative condition (i.e., enabling the proper RBM setpoint). If placed in this condition, the SR is met and the RBM channel is not considered inoperable. As noted, neutron detectors are excluded from the Surveillance because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.7. ~~The 24 month Frequency is based on the actual trip setpoint methodology utilized for these channels.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

REFERENCES

1. FSAR, Section 7.5.8.2.3.
2. FSAR, Section 7.16.5.3.1.k.
3. NEDC-32433P, "Maximum Extended Load Line Limit and ARTS Improvement Program Analyses for Browns Ferry Nuclear Plant Unit 1, 2 and 3," April 1995.
4. NEDE-24011-P-A-US, "General Electrical Standard Application for Reload Fuel," Supplement for United States, (revision specified in the COLR).
5. "Modifications to the Requirements for Control Rod Drop Accident Mitigating Systems," BWR Owners' Group, July 1986.
6. NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.
7. NRC SER, "Acceptance of Referencing of Licensing Topical Report NEDE-24011-P-A," "General Electric Standard Application for Reactor Fuel, Revision 8, Amendment 17," December 27, 1987.
8. NEDC-30851-P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.
9. GENE-770-06-1, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.
10. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
11. ~~NEDC-32410P-A, “Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function,” October 1995.~~ Deleted.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 2) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the feedwater pump turbines and main turbine will trip when necessary.

SR 3.3.2.2.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels, or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limits.

~~The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with the channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency of 92 days is based on reliability analysis (Ref. 2).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.2.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequency is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the feedwater and main turbine valves is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a valve is incapable of operating, the associated instrumentation would also be inoperable~~. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 14.5.7.

2. ~~GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-Of-Service Times for Selected Instrumentation Technical Specifications," February 1991.~~Deleted.

3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1.1

Performance of the CHANNEL CHECK for each required PAM instrumentation channel ~~once every 31 days~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel against a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrument channels should be compared to each other or to other containment radiation monitoring instrumentation.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

~~The Frequency of 31 days is based upon plant operating experience, with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of those displays associated with the required channels of this LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.1.2~~, SR 3.3.3.1.3, and SR 3.3.3.1.4~~

Deleted.

SR 3.3.3.1.3

A CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies the channel responds to measured parameter with the necessary range and accuracy. For the PCIV position function, the CHANNEL CALIBRATION consists of verifying the remote indications conform to actual valve positions. For the Primary Containment Area Radiation Function, the CHANNEL CALIBRATION consists of an electronic calibration of the channel not including the detector for ranges above 10 R/hr and a one-point source check of the detector below 10 R/hr with an installed or portable gamma source.

~~The 184 day frequency for CHANNEL CALIBRATION of the Reactor Pressure Indication is based on plant specific analysis. The 24 month Frequency for CHANNEL CALIBRATION of all other PAM instrumentation in Table 3.3.3.1-1 is based on operating experience and consistency with BFN refueling cycles.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS (continued)

B.1

If the Required Action and associated Completion Time of Condition A are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.3.2.1

SR 3.3.3.2.1 verifies each required Backup Control System transfer switch and control circuit performs the intended function. This verification is performed from the backup control panel and locally, as appropriate. Operation of the equipment from the backup control panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the plant can be placed and maintained in MODE 3 from the backup control panel and the local control stations. ~~Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.2.2 ~~and SR 3.3.3.2.3~~

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies the channel responds to measured parameter values with the necessary range and accuracy.

~~The Frequency of SR 3.3.3.2.2 is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The 24 month Frequency of SR 3.3.3.2.3 is based upon operating experience and consistency with the refueling cycle.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 19.
2. FSAR Section 7.18.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 5) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the recirculation pumps will trip when necessary.

SR 3.3.4.1.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency of 92 days is based on reliability analysis of Reference 5.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.1.2

This SR ensures that an EOC-RPT initiated from the TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 30% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 30% RTP, either due to open main turbine bypass valves or other reasons), the affected TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met with the channel considered OPERABLE.

~~The Frequency of 24 months is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.4.1.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. ~~The Frequency is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.1.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers is included as a part of this test, overlapping the LOGIC SYSTEM FUNCTIONAL TEST, to provide complete testing of the associated safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) would also be inoperable.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Figure 7.9-2 (EOC-RPT logic diagram).
2. FSAR, Section 7.9.4.5.
3. FSAR, Sections 14.5.1.1 and 14.5.1.2.
4. FSAR, Section 4.3.5.
5. GENE-770-06-1, "Bases For Changes To Surveillance Test Intervals And Allowed Out-Of-Service Times For Selected Instrumentation Technical Specifications," February 1991.
6. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.2.1 (continued)

~~The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.4.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency of 92 days is based on the reliability analysis of Reference 2.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.4.2.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequency is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) would be inoperable.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR Section 7.19.
2. GENE-770-06-1, "Bases for Changes To Surveillance Test Intervals and Allowed Out-of-Service Times For Selected Instrumentation Technical Specifications," February 1991.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted in the beginning of the SRs, the SRs for each ECCS instrumentation Function are found in the SRs column of Table 3.3.5.1-1.

The Surveillances are modified by a second Note (Note 2) to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours as follows: (a) for Functions 3.c and 3.f; and (b) for Functions other than 3.c and 3.f provided the associated Function or redundant Function maintains ECCS initiation capability. Maintenance of ECCS initiation capability refers to the ECCS function provided by the specific instrumentation as further described in the corresponding Required Action Bases for the instrumentation Function. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 4) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary.

SR 3.3.5.1.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.1 (continued)

instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency of 92 days is based on the reliability analyses of Reference 4.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.3~~, SR 3.3.5.1.4, and SR 3.3.5.1.5~~

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequencies of SR 3.3.5.1.3, SR 3.3.5.1.4, and SR 3.3.5.1.5 are based upon the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.1.4 and SR 3.3.5.1.5

Deleted.

SR 3.3.5.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation for a specific channel. The system functional testing performed in LCO 3.5.1, LCO 3.5.2, LCO 3.7.2, and LCO 3.8.1 overlaps this Surveillance to complete testing of the assumed safety function. The LOGIC SYSTEM FUNCTIONAL TEST shall include a calibration of time delay relays and timers necessary for proper functioning of the logic.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~

(continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVIELLANCE REQUIREMENTS

As noted in the beginning of the SRs, the SRs for each RPV Water Inventory Control Instrument Function are found in the SRs column of Table 3.3.5.2-1.

SR 3.3.5.2.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK guarantees that undetected outright channel failure is limited; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL FUNCTIONAL TEST.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The frequency of 12 hours is based upon operating experience that demonstrates channel failure is rare.~~

~~The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

(continued)

BASES

SURVIELLANCE REQUIREMENTS (continued)

~~The Frequency of 92 days is based upon operating experience that demonstrates channel failure is rare.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Information Notice 84-81 "Inadvertent Reduction in Primary Coolant Inventory in Boiling Water Reactors During Shutdown and Startup," November 1984.

2. Information Notice 86-74, "Reduction of Reactor Coolant Inventory Because of Misalignment of RHR Valves," August 1986.

3. Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(F), " August 1992.

4. NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs," May 1993.

5. Inadvertent Containment Spray and Reactor Vessel Draindown at Millstone 1," July 1994.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.3.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a parameter on other similar channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.3.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency of 92 days is based on the reliability analysis of Reference 1.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.3.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequency of SR 3.3.5.3.3 is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.3.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.3 overlaps this Surveillance to provide complete testing of the safety function.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. GENE-770-06-2, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The 92 day Frequency of SR 3.3.6.1.2 is based on the reliability analysis described in References 5 and 6.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.1.3 and SR 3.3.6.1.4 ~~and~~

Deleted.

SR 3.3.6.1.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequencies of SR 3.3.6.1.3, SR 3.3.6.1.4, and SR 3.3.6.1.5 are based on the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on PCIVs in LCO 3.6.1.3 overlaps this Surveillance to provide complete testing of the assumed safety function. The LOGIC SYSTEM FUNCTIONAL TEST shall include a calibration of time delay relays and timers necessary for proper functioning of the logic. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

~~Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 6.5.
2. FSAR, Chapter 14.
3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.
4. FSAR, Section 4.9.3.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency of 92 days is based on the reliability analysis of References 5 and 6.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This Surveillance for Functions 3 and 4 shall consist of verifying the High Voltage Power Supply (HVPS) voltage at the sensor and convertors (detectors) is within its design limits. A CHANNEL FUNCTIONAL TEST as defined in Section 1.1, "Definitions" shall be performed ~~once per 24 months~~ periodically as part of the CHANNEL CALIBRATION for Functions 3 and 4.

SR 3.3.6.2.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequency of SR 3.3.6.2.3 is based on the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on SCIVs and the SGT System in LCO 3.6.4.2 and LCO 3.6.4.3, respectively, overlaps this Surveillance to provide complete testing of the assumed safety function.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

~~Operating experience with these components supports performance of the Surveillance at their designated Frequencies. Therefore, the Frequency was found to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 5 and Section 7.3.5.
2. FSAR, Chapter 14.
3. FSAR, Section 14.6.3.5.
4. FSAR, Section 14.6.3.6.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.
7. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.1

Performance of the CHANNEL CHECK ~~once every 24 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

~~The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with channels required by the LCO.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.7.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1.2 (continued)

~~The Frequency of 92 days is based on the reliability analyses of References 3 and 4.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This Surveillance for Functions 3 and 4 shall consist of verifying the High Voltage Power Supply (HVPS) voltage at the Sensor and Convertors (detectors) is within its design limits. A CHANNEL FUNCTIONAL TEST as defined in Section 1.1, "Definitions" shall be performed ~~once per 24 months~~ as part of the CHANNEL CALIBRATION for Functions 3 and 4.

SR 3.3.7.1.3 ~~and SR 3.3.7.1.5~~

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequencies are based upon the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.4 ~~and SR 3.3.7.1.6~~

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.7.3, "Control Room Emergency Ventilation (CREV) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

~~The 184 day Frequency for Function 5 is based on equipment capability. The 24 month Frequency for Functions 1, 2, 3, and 4 is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at their designated Frequencies.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 10.12.5.3.
2. FSAR, Section 14.6.3.7.
3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.
4. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

E.1

If any Required Action and associated Completion Time are not met, the associated Function is not capable of performing the intended function. Therefore, the associated DG(s) is declared inoperable immediately. This requires entry into applicable Conditions and Required Actions of LCO 3.8.1 and LCO 3.8.2, which provide appropriate actions for the inoperable DG(s).

SURVEILLANCE REQUIREMENTS

As noted (Note 1) at the beginning of the SRs, the SRs for each LOP instrumentation Function are located in the SRs column of Table 3.3.8.1-1.

SR 3.3.8.1.1 ~~and SR 3.3.8.1.2~~

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The Frequency is based upon the calibration interval assumed in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.8.1.2

Deleted.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1.3

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed in LCO 3.8.1 and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety functions.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Figure 8.4-4.
2. FSAR, Section 6.5.
3. FSAR, Section 8.5.4.
4. FSAR, Chapter 14.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.1

A CHANNEL FUNCTIONAL TEST is performed on each overvoltage, undervoltage, and underfrequency channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

~~The 184 day Frequency is based on operating experience and the need to calibrate the instrument loop and sensor.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.8.2.2

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequency is based on the assumption of a 184 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.2.3

Performance of a system functional test demonstrates that, with a required system actuation (simulated or actual) signal, the logic of the system will automatically trip open the associated power monitoring assembly. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E contactors is included as part of this test to provide complete testing of the safety function. If the contactors are incapable of operating, the associated electric power monitoring assembly would be inoperable.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 7.2.3.2.

2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

This SR ensures the recirculation loops are within the allowable limits for mismatch. At low core flow (i.e., < 70% of rated core flow), the MCPR requirements provide larger margins to the fuel cladding integrity Safety Limit such that the potential adverse effect of early boiling transition during a LOCA is reduced. A larger flow mismatch can therefore be allowed when core flow is < 70% of rated core flow. The recirculation loop jet pump flow, as used in this Surveillance, is the summation of the flows from all of the jet pumps associated with a single recirculation loop.

The mismatch is measured in terms of percent of rated core flow. If the flow mismatch exceeds the specified limits, the loop with the lower flow is considered inoperable. The SR is not required when both loops are not in operation since the mismatch limits are meaningless during single loop or natural circulation operation. The Surveillance must be performed within 24 hours after both loops are in operation. ~~The 24 hour Frequency is consistent with the Surveillance Frequency for jet pump OPERABILITY verification and has been shown by operating experience to be adequate to detect off normal jet pump loop flows in a timely manner.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1 (continued)

Individual jet pumps in a recirculation loop normally do not have the same flow. The unequal flow is due to the drive flow manifold, which does not distribute flow equally to all risers. The flow (or jet pump diffuser to lower plenum differential pressure) pattern or relationship of one jet pump to the loop average is repeatable. An appreciable change in this relationship is an indication that increased (or reduced) resistance has occurred in one of the jet pumps. This may be indicated by an increase in the relative flow for a jet pump that has experienced beam cracks.

The deviations from normal are considered indicative of a potential problem in the recirculation drive flow or jet pump system (Ref. 2). Normal flow ranges and established jet pump flow and differential pressure patterns are established by plotting historical data as discussed in Reference 2.

~~The 24 hour Frequency has been shown by operating experience to be timely for detecting jet pump degradation and is consistent with the Surveillance Frequency for recirculation loop OPERABILITY verification.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. Note 1 allows this Surveillance not to be performed until 4 hours after the associated recirculation loop is in operation, since these checks can only be performed during jet pump operation. The 4 hours is an acceptable time to establish conditions appropriate for data collection and evaluation.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.3.2 (continued)

~~The 24 month Frequency was developed based on the S/RV tests required by the ASME OM Code (Ref. 3). Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 4.4.6.
2. FSAR, Section 14.5.1.
3. ASME Code for Operation and Maintenance of Nuclear Power Plants (ASME OM Code).
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

C.1 and C.2

If any Required Action and associated Completion Time of Condition A or B is not met or if pressure boundary LEAKAGE exists, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

The RCS LEAKAGE is monitored by a variety of instruments designed to provide alarms when LEAKAGE is indicated and to quantify the various types of LEAKAGE. Leakage detection instrumentation is discussed in more detail in the Bases for LCO 3.4.5, "RCS Leakage Detection Instrumentation." Sump level and flow rate are typically monitored to determine actual LEAKAGE rates; however, other methods may be used to quantify LEAKAGE. ~~In conjunction with alarms and other administrative controls, a 12 hour Frequency for this Surveillance is appropriate for identifying LEAKAGE and for tracking required trends (Ref. 7)~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program..

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 50.2.
2. 10 CFR 50.55a(c).
3. 10 CFR 50, Appendix A, GDC 55.
4. GEAP-5620, "Failure Behavior in ASTM A106B Pipes Containing Axial Through-Wall Flaws," April 1968.
5. NUREG-75/067, "Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping in Boiling Water Reactors," October 1975.
6. FSAR, Section 4.10.3.2.
7. ~~Generic Letter 88-01, Supplement 1, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," February 1992~~Deleted.
8. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR is for the performance of a CHANNEL CHECK of the required primary containment atmospheric monitoring system instrumentation. The check gives reasonable confidence that the channel is operating properly. ~~The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.5.2

This SR is for the performance of a CHANNEL FUNCTIONAL TEST of the required primary containment atmospheric monitoring system instrumentation. The test ensures that the monitors can perform their function in the desired manner. The test also verifies the alarm setpoint and relative accuracy of the instrument string. ~~The Frequency of 31 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.5.3

This SR is for the performance of a CHANNEL CALIBRATION of required drywell floor drain sump flow integrator instrumentation channels. The calibration verifies the accuracy of the instrument string. ~~The Frequency of 184 days considers channel reliability. Operating experience has proven this Frequency is acceptable.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.5.4

This SR is for the performance of a CHANNEL CALIBRATION of required leakage detection system instrumentation channels. The calibration verifies the accuracy of the instrument string. ~~The Frequency of 24 months is a typical refueling cycle and considers channel reliability. Operating experience with these components supports performance of the Surveillance at this Frequency.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.

2. FSAR, Section 4.10.3.

3. GEAP-5620, "Failure Behavior in ASTM A106B Pipes Containing Axial Through-Wall Flaws," April 1968.

4. NUREG-75/067, "Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping in Boiling Water Reactors," October 1975.

5. FSAR, Section 4.10.3.2.

6. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This Surveillance is performed to ensure iodine remains within limit during normal operation. ~~The 7 day Frequency is adequate to trend changes in the iodine activity level.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. This SR is modified by a Note that requires this Surveillance to be performed only in MODE 1 because the level of fission products generated in other MODES is much less.

REFERENCES

1. 10 CFR 50.67.
2. FSAR, Section 14.6.5.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. ~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem and recirculation pump in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This Surveillance is modified by a Note allowing sufficient time to align the RHR System for shutdown cooling operation after clearing the pressure interlock that isolates the system, or for placing a recirculation pump in operation. The Note takes exception to the requirements of the Surveillance being met (i.e., forced coolant circulation is not required for this initial 2 hour period), which also allows entry into the Applicability of this Specification in accordance with SR 3.0.4 since the Surveillance will not be "not met" at the time of entry into the Applicability.

REFERENCES

1. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS

B.1 and B.2 (continued)

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR shutdown cooling subsystem or recirculation pump), the reactor coolant temperature and pressure must be periodically monitored to ensure proper function of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This Surveillance verifies that one required RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. ~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem and recirculation pump in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS

C.1 and C.2 (continued)

analyses, or inspection of the components. ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

Condition C is modified by a Note requiring Required Action C.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

Verification that operation is within limits is required ~~every 30 minutes~~ when RCS pressure and temperature conditions are undergoing planned changes. ~~This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature rate of change limits are specified in hourly increments, 30 minutes permits a reasonable time for assessment and correction of minor deviations.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Surveillance for heatup, cooldown, or inservice leakage and hydrostatic testing may be discontinued when the criteria given in the relevant plant procedure for ending the activity are satisfied.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.9.5, SR 3.4.9.6, and SR 3.4.9.7

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

The flange temperatures must be verified to be above the limits ~~30 minutes~~ before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. When in MODE 4 with RCS temperature ≤ 85°F, ~~30 minute~~ checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 100°F, monitoring of the flange temperature is required ~~every 12 hours~~ to ensure the temperature is > 83°F.

~~The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.9.5 is modified by two Notes. Note 1 requires the Surveillance to be performed only when tensioning the reactor vessel head bolting studs. Note 2 allows the reactor vessel head bolts to be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are > 70°F. SR 3.4.9.6 is modified by a Note that requires the

(continued)

BASES (continued)

ACTIONS

A.1

With the reactor steam dome pressure greater than the limit, prompt action should be taken to reduce pressure to below the limit and return the reactor to operation within the bounds of the analyses. The 15 minute Completion Time is reasonable considering the importance of maintaining the pressure within limits. This Completion Time also ensures that the probability of an accident occurring while pressure is greater than the limit is minimized. If the operator is unable to restore the reactor steam dome pressure to below the limit, then the reactor should be placed in MODE 3 to be operating within the assumptions of the transient analyses.

B.1

If the reactor steam dome pressure cannot be restored to within the limit within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1

Verification that reactor steam dome pressure is ≤ 1050 psig ensures that the initial conditions of the design basis accidents and transients are met. ~~Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS (continued)

G.1 and G.2

If any Required Action and associated Completion Time of Condition C, D, E, or F is not met, or if two or more ADS valves are inoperable, the plant must be brought to a condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and reactor steam dome pressure reduced to ≤ 150 psig within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

H.1

When multiple ECCS subsystems are inoperable, as stated in Condition H, the plant is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge lines of the HPCI System, CS System, and LPCI subsystems full of water ensures that the ECCS will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. ~~The 31 day Frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls governing system operation, and operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. For the HPCI System, this SR also includes the steam flow path for the turbine and the flow controller position.

~~The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve position would only affect a single subsystem. This Frequency has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that allows LPCI subsystems to be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the RHR low pressure permissive pressure in MODE 3, if capable of being manually realigned (remote or local) to the LPCI mode and not otherwise inoperable. This allows operation in the RHR shutdown cooling mode during MODE 3, if necessary.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.3

Verification ~~every 31 days t~~hat ADS air supply header pressure is ≥ 81 psig ensures adequate air pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The design pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least two valve actuations can occur with the drywell at 62.5% of design pressure plus three additional actuations at 0 psig drywell pressure (Ref. 10). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ 81 psig is provided by the Drywell Control Air System. ~~The 31 day Frequency takes into consideration administrative controls over operation of the air system and alarms for low air pressure.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.1.4

Deleted.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.6, SR 3.5.1.7, and SR 3.5.1.8 (continued)

pressure and flow are achieved to perform these tests. Reactor startup is allowed prior to performing the low pressure Surveillance test because the reactor pressure is low and the time allowed to satisfactorily perform the Surveillance test is short. Alternately, the low pressure Surveillance test may be performed prior to startup using an auxiliary steam supply. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed that the low pressure test has been satisfactorily completed and there is no indication or reason to believe that HPCI is inoperable.

Therefore, SR 3.5.1.7 and SR 3.5.1.8 are modified by Notes that state the Surveillances are not required to be performed until 12 hours after the reactor steam pressure and flow are adequate to perform the test.

The Frequency for SR 3.5.1.6 ~~and SR 3.5.1.7~~ is in accordance with the Inservice Testing Program requirements. The ~~24 month~~ Frequencies~~y~~ for SR 3.5.1.7 and SR 3.5.1.8 are controlled under the Surveillance Frequency Control Program.~~is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.9

The ECCS subsystems are required to actuate automatically to perform their design functions. This Surveillance verifies that, with a required system initiation signal (actual or simulated), the automatic initiation logic of HPCI, CS, and LPCI will cause the systems or subsystems to operate as designed, including actuation of the system throughout its emergency operating sequence, automatic pump startup and actuation of all automatic valves to their required positions. This SR also ensures that the HPCI System will automatically restart on an RPV low-low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlaps this Surveillance to provide complete testing of the assumed safety function.

~~The 24 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

~~Operating experience with these components supports performance of the Surveillance at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that excludes vessel injection/spray during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.10

The ADS designated S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to demonstrate that the mechanical portions of the ADS function (i.e., solenoids) operate as designed when initiated either by an actual or simulated initiation signal, causing proper actuation of all the required components. SR 3.5.1.11 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

~~The 24 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that excludes valve actuation. This prevents an RPV pressure blowdown.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.11 (continued)

~~The Frequency of 24 months is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

is only considered an intact closed system when misalignment issues (Reference 6) have been precluded by functional valve interlocks or by isolation devices, such that redirection of RPV water out of an RHR subsystem is precluded. Further, RHR Shutdown Cooling System is only considered an intact closed system if its controls have not been transferred to Remote Shutdown, which disables the interlocks and isolation signals.

The exclusion of penetration flow paths from the determination of DRAIN TIME must consider the potential effects of a single operator error or initiating event on items supporting maintenance and testing (rigging, scaffolding, temporary shielding, piping plugs, snubber removal, freeze seals, etc.). If failure of such items could result and would cause a draining event from a closed system or between the RPV and the isolation device, the penetration flow path may not be excluded from the DRAIN TIME calculation.

Surveillance Requirement 3.0.1 requires SRs to be met between performances. Therefore, any changes in plant conditions that would change the DRAIN TIME requires that a new DRAIN TIME be determined.

~~The Frequency of 12 hours is sufficient in view of indications of RPV water level available to the operator.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.2

The minimum water level of -6.25 inches with or -7.25 inches without differential pressure control, as indicated on narrow range instrumentation, required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the CS subsystem or LPCI subsystem pump, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit, all ECCS injection/spray subsystems are inoperable.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.2 (continued)

~~The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool water level variations. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool water level condition.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.3

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge lines of the required ECCS injection/spray subsystems full of water ensures that the ECCS subsystem will perform properly. This may also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. ~~The 31 day Frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls governing system operation, and operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.4

Verifying the correct alignment for manual, power operated, and automatic valves in the required ECCS subsystem flow path provides assurance that the proper flow paths will be available for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not

(continued)

apply to valves that cannot be inadvertently misaligned, such as check valves. ~~The 31 day Frequency is appropriate because the valves are operated under procedural control and the probability of their being mispositioned during this time period is low.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.5

Verifying that the required ECCS injection/spray subsystem can be manually started and operate for at least 10 minutes demonstrates that the subsystem is available to mitigate a draining event. Testing the ECCS injection/spray subsystem through the test return line is necessary to avoid overfilling the refueling cavity. The minimum operating time of 10 minutes was based on engineering judgement. ~~The performance frequency of 92 days is consistent with similar at-power testing required by SR 3.5.1.7.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.6

Verifying that each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated RPV water level isolation signal is required to prevent RPV water inventory from dropping below the TAF should an unexpected draining event occur. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.7

The required ECCS subsystem is required to have a manual start capability. The ECCS subsystem is verified to start manually from a standby configuration.

~~The 24 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

~~Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that excludes vessel injection/spray during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test return line, coolant injection into the RPV is not required during the Surveillance. Notwithstanding, this SR includes verifying that the ECCS injection valve can be opened.

REFERENCES

1. Information Notice 84-81 "Inadvertent Reduction in Primary Coolant Inventory in Boiling Water Reactors During Shutdown and Startup," November 1984.

2. Information Notice 86-74, "Reduction of Reactor Coolant Inventory Because of Misalignment of RHR Valves," August 1986.

3. Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(F), " August 1992.

4. NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs," May 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge line of the RCIC System full of water ensures that the system will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. This will also prevent a water hammer following an initiation signal. One acceptable method of ensuring the line is full is to vent at the high points. ~~The 31 day Frequency is based on the gradual nature of void buildup in the RCIC piping, the procedural controls governing system operation, and operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.3.2

Verifying the correct alignment for manual, power operated, and automatic valves in the RCIC flow path provides assurance that the proper flow path will exist for RCIC operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.2 (continued)

in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. For the RCIC System, this SR also includes the steam flow path for the turbine and the flow controller position.

~~The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve position would affect only the RCIC System. This Frequency has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.3.3 and SR 3.5.3.4

The RCIC pump flow rates ensure that the system can maintain reactor coolant inventory during pressurized conditions with the RPV isolated. The flow tests for the RCIC System are performed at two different pressure ranges such that system capability to provide rated flow is tested both at the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the RCIC System diverts steam flow. Reactor steam pressure must be ≥ 950 psig to perform SR 3.5.3.3 and ≥ 150 psig to perform SR 3.5.3.4. Adequate steam flow is represented by at least one turbine bypass valve full open for SR 3.5.3.3 and at least one turbine bypass valve > 50% open for SR 3.5.3.4. Therefore, sufficient time is allowed

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.3 and SR 3.5.3.4 (continued)

after adequate pressure and flow are achieved to perform these SRs. Reactor startup is allowed prior to performing the low pressure Surveillance because the reactor pressure is low and the time allowed to satisfactorily perform the Surveillance is short. Alternately, the low pressure Surveillance test may be performed prior to startup using an auxiliary steam supply. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed that the low pressure Surveillance has been satisfactorily completed and there is no indication or reason to believe that RCIC is inoperable. Therefore, these SRs are modified by Notes that state the Surveillances are not required to be performed until 12 hours after the reactor steam pressure and flow are adequate to perform the test.

~~A 92 day Frequency for SR 3.5.3.3 is consistent with the Inservice Testing Program requirements. The 24 month Frequency for SR 3.5.3.4 is based on the need to perform the Surveillance under conditions that apply just prior to or during a startup from a plant outage. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.5

The RCIC System is required to actuate automatically in order to perform its design function satisfactorily. This Surveillance verifies that, with a required system initiation signal (actual or simulated), the automatic initiation logic of the RCIC System will cause the system to operate as designed, including actuation of the system throughout its emergency operating sequence; that is, automatic pump startup and actuation of all automatic valves to their required positions. This test also ensures the RCIC System will automatically restart on an RPV low-low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.3 overlaps this Surveillance to provide complete testing of the assumed safety function.

~~The 24 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that excludes vessel injection during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1.2 (continued)

Satisfactory performance of this SR can be achieved by establishing a known differential pressure between the drywell and the suppression chamber and verifying that the pressure in either the suppression chamber or the drywell does not change by more than 0.25 inch of water per minute over a 10 minute period. ~~The leakage test is performed every 24 months. The 24 month Frequency was developed considering it is prudent that this Surveillance be performed during a unit outage and also in view of the fact that component failures that might have affected this test are identified by other primary containment SRs.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.2.
2. FSAR, Section 14.6.
3. 10 CFR 50, Appendix J, Option B.
4. NEI 94-01, Revision O, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J."
5. ANSI/ANS-56.8-1994, "American National Standard for Containment System Leakage Testing Requirement."
6. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.1 (continued)

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 requires the results of airlock leakage tests be evaluated against the acceptance criteria of the Primary Containment Leakage Rate Testing Program, 5.5.12. This ensures that the airlock leakage is properly accounted for in determining the combined Type B and C primary containment leakage.

SR 3.6.1.2.2

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure, closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. ~~Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the primary containment air lock door~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.2 (continued)

~~is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed every 24 months. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of primary containment OPERABILITY if the Surveillance were performed with the reactor at power. The 24 month Frequency for the interlock is justified based on operating experience.~~

~~The Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during the use of the airlock.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.2.3.4.5.
2. 10 CFR 50, Appendix J, Option B.
3. FSAR, Section 5.2.
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.1 (continued)

following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. ~~The 31 day Frequency is consistent with other PCIV requirements discussed in SR 3.6.1.3.2.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.3.2

This SR verifies that each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured, and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design limits. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

This SR does not require any testing or valve manipulation. Rather, it involves verification that those PCIVs outside primary containment, and capable of being mispositioned, are in the correct position. ~~Since verification of valve position for PCIVs outside primary containment is relatively easy, the 31 day Frequency was chosen to provide added assurance that the PCIVs are in the correct positions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.4

The traversing incore probe (TIP) shear isolation valves are actuated by explosive charges. Surveillance of explosive charge continuity provides assurance that TIP valves will actuate when required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. ~~The 31 day Frequency is based on operating experience that has demonstrated the reliability of the explosive charge continuity.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.3.5

Verifying the isolation time of each power operated, automatic PCIV is within limits is required to demonstrate OPERABILITY. MSIVs may be excluded from this SR since MSIV full closure isolation time is demonstrated by SR 3.6.1.3.6. The isolation time test ensures that the valve will isolate in a time period less than or equal to that assumed in the safety analyses. The isolation time and Frequency of this SR are in accordance with the requirements of the Inservice Testing Program.

SR 3.6.1.3.6

Verifying that the isolation time of each MSIV is within the specified limits is required to demonstrate OPERABILITY. The isolation time test ensures that the MSIV will isolate in a time period that does not exceed the times assumed in the DBA analyses. This ensures that the calculated radiological consequences of these events remain within 10 CFR 50.67 limits. The Frequency of this SR is in accordance with the requirements of the Inservice Testing Program.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.7

Automatic PCIVs close on a primary containment isolation signal to prevent leakage of radioactive material from primary containment following a DBA. This SR ensures that each automatic PCIV will actuate to its isolation position on a primary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.1 overlaps this SR to provide complete testing of the safety function. ~~The 24 month Frequency was developed considering it is prudent that this Surveillance be performed only during a unit outage since isolation of penetrations would eliminate cooling water flow and disrupt the normal operation of many critical components. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.3.8

This SR requires a demonstration that a representative sample of reactor instrumentation line excess flow check valves (EFCV) are OPERABLE by verifying that the valves actuate to the isolation position on an actual or simulated instrument line break signal. This SR provides assurance that the instrumentation line EFCVs will perform so that the radiological consequences will not exceed the predicted radiological consequences during events evaluated in Reference 5. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The representative sample consist of an approximately equal number of EFCVs tested each 24 months, such that each EFCV is tested at least once every 120 months (nominal).~~

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.8 (continued)

~~The nominal 120 month interval is based on other performance-based testing programs such as Inservice Testing (snubbers) and Option B to 10 CFR 50, Appendix J. EFCV test failures will be evaluated to determine if additional testing in that test interval is warranted to ensure the overall reliability is maintained. Operating experience has demonstrated that failures to isolate are very infrequent. Therefore, testing of a representative sample was concluded to be acceptable from a reliability standpoint (Reference 8).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.9

The TIP shear isolation valves are actuated by explosive charges. An in place functional test is not possible with this design. The explosive squib is removed and tested to provide assurance that the valves will actuate when required. The replacement charge for the explosive squib shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. ~~The Frequency of 24 months on a STAGGERED TEST BASIS is considered adequate given the administrative controls on replacement charges and the frequent checks of circuit continuity (SR 3.6.1.3.4).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.3.10

The analyses in References 1 and 5 are based on leakage that is less than the specified leakage rate. Leakage through each MSIV must be $\leq$ 100 scfh when tested at $\geq P_t$ (25 psig). The combined leakage rate for all four main steam lines must be $\leq$ 150 scfh when tested at $\geq$ 25 psig in accordance with the Primary Containment Leakage Rate Testing Program. If the leakage rate through an individual MSIV exceeds 100 scfh, the leakage rate shall be restored below the alarm limit value as specified in the Containment Leakage Rate Testing Program referenced in TS 5.5.12. This ensures that MSIV leakage is properly accounted for in determining the overall primary containment leakage rate. The Frequency is specified in the Primary Containment Leakage Rate Testing Program.

(continued)

BASES

REFERENCES

1. FSAR, Section 14.6.
2. BFN Technical Instruction (TI), 0-TI-360.
3. 10 CFR 50, Appendix J, Option B.
4. FSAR, Section 5.2.
5. FSAR, Section 14.6.5.
6. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
7. FSAR Table 5.2-2.
8. ~~General Electric NEDO-32977-A (Boiling Water Reactor Owners Group Topical Report, B21-00658-01), "Excess Flow Check Valve Testing Relaxation", dated June 2000~~Deleted.
9. MDQ0000012016000566, Revision 0, "Main Steam Isolation Valve (MSIV) Loss of Coolant Accident (LOCA) Closure Analysis," dated September 2016.

BASES

ACTIONS (continued)

B.1 and B.2

If the drywell average air temperature cannot be restored to within limit within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.4.1

Verifying that the drywell average air temperature is within the LCO limit ensures that operation remains within the limits assumed for the primary containment analyses. Drywell air temperature is monitored in various quadrants and at various elevations (referenced to mean sea level). Due to the shape of the drywell, a volumetric average is used to determine an accurate representation of the actual average temperature.

~~The 24 hour Frequency of the SR was developed based on operating experience related to drywell average air temperature variations and temperature instrument drift during the applicable MODES and the low probability of a DBA occurring between surveillances. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal drywell air temperature condition.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.5.1

Each vacuum breaker is verified to be closed to ensure that a potential breach in the primary containment boundary is not present. This Surveillance is performed by observing local or control room indications of vacuum breaker position or by verifying a differential pressure of 0.5 psid is maintained between the reactor building and suppression chamber. ~~The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Two Notes are added to this SR. The first Note allows reactor building-to-suppression chamber vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable breakers. A second Note is included to clarify that vacuum breakers open due to an actual differential pressure, are not considered as failing this SR.

SR 3.6.1.5.2

Each vacuum breaker must be cycled to ensure that it opens properly to perform its design function and returns to its fully closed position. This ensures that the safety analysis assumptions are valid. ~~The 92 day Frequency of this SR was developed based upon Inservice Testing Program requirements to perform valve testing at least once every 92 days.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.5.3

Demonstration of vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of ≤ 0.5 psid is valid. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at this Frequency. The 24 month Frequency is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. TVA Calculation ND-Q0064-900040.

2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.6.1

Each vacuum breaker is verified closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker position indication or by verifying that the rate of increase in suppression chamber pressure is less than 0.25 inches of water per minute over a ten minute period at a differential pressure of at least 1.0 psi. Note 2 specifies that vacuum breaker may be nonfully closed provided it is not more than 3° open as indicated by position indication lights. ~~The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Note 1 has been added to this SR which allows suppression chamber-to-drywell vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers.

SR 3.6.1.6.2

Each required (i.e., required to be OPERABLE for opening) vacuum breaker must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This ensures that the safety analysis assumptions are valid. The Inservice Testing Program Frequency is based on operating experience that has demonstrated that the Frequency is adequate to assure OPERABILITY.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.6.3

Verification of the differential pressure required to open the vacuum breaker is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of 0.5 psid is valid. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. The 24 month Frequency is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.2.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
3. Technical Requirements Manual.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1.1

The suppression pool average temperature is regularly monitored to ensure that the required limits are satisfied. The average temperature is determined by taking an arithmetic average of OPERABLE suppression pool water temperature channels~~. The 24 hour Frequency has been shown, based on operating experience, to be acceptable. When heat is being added to the suppression pool by testing, however, it is necessary to monitor suppression pool temperature more frequently.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The 5 minute Frequency during testing is justified by the rates at which tests will heat up the suppression pool, has been shown to be acceptable based on operating experience, and provides assurance that allowable pool temperatures are not exceeded. The Frequenc~~ies~~y is ~~are~~ further justified in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool average temperature condition.

REFERENCES

1. FSAR, Section 5.2.
2. FSAR, Section 14.6.
3. NUREG-0783, Suppression Pool Temperature Limits for BWR Containments, November 1981.
4. NUREG-0661, "Safety Evaluation Report Mark I Containment Long Term Program - Resolution of Generic Technical Activity A-7," July 1980.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
6. NEDC-22004-P, “Browns Ferry Nuclear Plant Units 1, 2, and 3 Suppression Pool Temperature Response,” October 1981.

BASES

ACTIONS (continued)

B.1 and B.2

If suppression pool water level cannot be restored to within limits within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2.1

Verification of the suppression pool water level is to ensure that the required limits are satisfied. ~~The 24 hour Frequency of this SR was developed considering operating experience related to trending variations in suppression pool water level and water level instrument drift during the applicable MODES and to assessing the proximity to the specified LCO level limits. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool water level condition.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Sections 5.2 and 14.6.3.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

D.1 and D.2

If any Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR suppression pool cooling mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

~~The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1 (continued)

sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool spray mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

~~The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.2.4.2

This Surveillance is performed ~~every 5 years~~ using air or water to verify that the spray nozzles are not obstructed and that flow will be provided when required. ~~The 5 year Frequency is adequate to detect degradation in performance due to the passive nozzle design and its normally dry state and has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Sections 5.2 and 14.6.3.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

D.1 and D.2

If any Required Action and the associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR drywell spray mode flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR drywell cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

~~The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.2.5.2

This Surveillance is performed ~~every 5 years~~ using air to verify that the spray nozzles are not obstructed and that flow will be provided when required. ~~The 5 year Frequency is adequate to detect degradation in performance due to the passive nozzle design and its normally dry state and has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Sections 5.2 and 14.6.3.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.6.1

The drywell-to-suppression chamber differential pressure is regularly monitored to ensure that the required limits are satisfied. ~~The 12 hour Frequency of this SR was developed based on operating experience relative to differential pressure variations and pressure instrument drift during applicable MODES and by assessing the proximity to the specified LCO differential pressure limit. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal pressure condition.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.2.3.9.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS

B.1and B.2 (continued)

The Completion Time of 7 days is a reasonable time to allow continued reactor operation with two CAD subsystems inoperable because the hydrogen control function is maintained (via the Primary Containment Inerting System) and because of the low probability of the occurrence of a LOCA that would generate hydrogen in amounts capable of exceeding the flammability limit.

C.1

If any Required Action cannot be met within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1.1

Verifying that there is ≥ 2500 gal of liquid nitrogen supply in each nitrogen storage tank will ensure at least 7 days of post-LOCA CAD operation. This minimum volume of liquid nitrogen allows sufficient time after an accident to replenish the nitrogen supply for long term inerting. ~~This is verified every 31 days to ensure that the system is capable of performing its intended function when required. The 31 day Frequency is based on operating experience, which has shown 31 days to be an acceptable period to verify the liquid nitrogen supply and on the availability of other hydrogen mitigating systems.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.1.2

Verifying the correct alignment for manual, power operated, and automatic valves in each of the CAD subsystem flow paths provides assurance that the proper flow paths exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing.

A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable because the CAD System is manually initiated. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

~~The 31 day Frequency is appropriate because the valves are operated under procedural control, improper valve position would only affect a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2.1

The primary containment (drywell and suppression chamber) must be determined to be inert by verifying that oxygen concentration is < 4.0 v/o. ~~The 7 day Frequency is based on the slow rate at which oxygen concentration can change and on other indications of abnormal conditions (which would lead to more frequent checking by operators in accordance with plant procedures). Also, this Frequency has been shown to be acceptable through operating experience.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.2.6.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.1 and SR 3.6.4.1.2

Verifying that secondary containment equipment hatches and one access door in each access opening are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the secondary containment will not occur. In this application, the term "sealed" has no connotation of leak tightness. Maintaining secondary containment OPERABILITY requires verifying one door in the access opening is closed. An access opening contains one inner and one outer door. In some cases, secondary containment access openings are shared such that a secondary containment barrier may have multiple inner doors. The main Equipment Access Lock (EAL) has a smaller sub-door on each of the large inner and outer main EAL doors. For the EAL, maintaining secondary containment OPERABILITY requires verifying that a large door and its integral sub-door are both closed. The intent is to not breach the secondary containment at any time when secondary containment is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times. However, all secondary containment access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. ~~The 31 day Frequency for these SRs has been shown to be adequate, based on operating experience, and is considered adequate in view of the other indications of door and hatch status that are available to the operator.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.1.3 and SR 3.6.4.1.4

The SGT System exhausts the secondary containment atmosphere to the environment through appropriate treatment equipment. To ensure that all fission products are treated, SR 3.6.4.1.3 verifies that the SGT System will rapidly establish and maintain a pressure in the secondary containment that is less than the lowest postulated pressure external to the secondary containment boundary. This is confirmed by demonstrating that two SGT subsystems will draw down the secondary containment to ≥ 0.25 inches of vacuum water gauge in ≤ 120 seconds. This cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.4 demonstrates that two SGT subsystems can maintain ≥ 0.25 inches of vacuum water gauge at a stable flow rate ≤ 12,000 cfm. Both of these SRs are performed under neutral (< 5 mph) wind conditions. Therefore, these two tests are used to ensure secondary containment boundary integrity. Since these SRs are secondary containment tests, they need not be performed with each combination of SGT subsystems. ~~The SGT subsystems are tested on a STAGGERED TEST BASIS, however, to ensure that in addition to the requirements of LCO 3.6.4.3, any two SGT subsystems will perform this test. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.3.
2. FSAR, Section 14.6.3.
3. Deleted.
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

Verifying that the isolation time of each power operated, automatic SCIV is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCIV will isolate in a time period less than or equal to that assumed in the safety analyses. ~~The Frequency of this SR is 92 days.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.4.2.2

Verifying that each automatic SCIV closes on a secondary containment isolation signal is required to prevent leakage of radioactive material from secondary containment following a DBA or other accidents. This SR ensures that each automatic SCIV will actuate to the isolation position on a secondary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," overlaps this SR to provide complete testing of the safety function. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 14.6.3.
2. Deleted.
3. Technical Requirements Manual.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem for ≥ 10 continuous hours ensures that the subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation with the heaters on (automatic heater cycling to maintain temperature) for ≥ 10 continuous hours ~~every 31 days~~ eliminates moisture on the adsorbers and HEPA filters. ~~The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). This SR will also include a chemical smoke test to check the sealing of gaskets for filter housing doors.

Specific test frequencies and additional information are discussed in detail in the VFTP.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.3.3

This SR verifies that each SGT subsystem starts on receipt of an actual or simulated initiation signal. ~~While this Surveillance can be performed with the reactor at power, operating experience with these components supports performance of the Surveillance at the 24 month Frequency. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," overlaps this SR to provide complete testing of the safety function. Therefore, the Frequency was found to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.4.3.4

This SR verifies that the SGT decay heat discharge dampers are in the correct position. This ensures that the decay heat removal mode of SGT System operation is available. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 12 month Frequency. Therefore, the Frequency was found to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. FSAR, Section 5.3.3.7.
3. FSAR, Section 14.6.
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

G.1 and G.2

If the RHRSW subsystem(s) or the RHRSW pump(s) cannot be restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system.

This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS

A.1 (continued)

The 7 day Completion Time is based on the redundant EECW System capabilities afforded by the remaining OPERABLE pumps, the low probability of an accident occurring during this time period and is consistent with the allowed Completion Time for restoring an inoperable DG.

B.1 and B.2

If the required EECW pump cannot be restored to OPERABLE status within the associated Completion Time, or two or more EECW pumps are inoperable or the UHS is determined inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

Verification of the UHS temperature ensures that the heat removal capability of the EECW System is within the assumptions of the DBA analysis (Ref. 5) and is sufficient for removal of heat from supported equipment to maintain OPERABILITY of that equipment. ~~The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.2

Verifying the correct alignment for each manual and power operated valve in the EECW System flow paths provide assurance that the proper flow paths will exist for EECW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be automatically realigned to its accident position within the required time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This SR is modified by a Note indicating that isolation of the EECW System to components or systems may render those components or systems inoperable, but does not affect the OPERABILITY of the EECW System. As such, when required EECW pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the EECW System is still OPERABLE.

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.3

This SR verifies that the EECW System pumps will automatically start to provide cooling water to the required safety related equipment during an accident event. This is demonstrated by the use of an actual or simulated initiation signal. This SR includes a functional test of the initiation logic and a functional test and calibration of the EECW pump timers (both normal power and diesel power).

~~Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 5.
2. FSAR, Chapter 14.
3. FSAR, Section 10.10.
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
5. FSAR, Section 14.6.3.3.2.3.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that a subsystem in a standby mode starts on demand and continues to operate. Standby systems should be checked periodically to ensure that they start and function properly. As the environmental and normal operating conditions of this system are not severe, testing each subsystem once every month provides an adequate check on this system. Monthly heater operation dries out any moisture that has accumulated in the charcoal as a result of humidity in the ambient air. The CREV System must be operated for ≥ 10 continuous hours with the heaters energized to dry out any moisture and to demonstrate the function of the system. ~~Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.3.2

This SR verifies that the required CREV testing is performed in accordance with the VFTP. The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.3.3

This SR verifies that on an actual or simulated initiation signal, each CREV subsystem starts and operates. This SR includes verification that dampers necessary for proper CREV operation function as required. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.4 and SR 3.3.7.1.6 overlaps this SR to provide complete testing of the safety function. ~~The Frequency of 24 months is based on BFN's normal operating cycle.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.3.4

This SR verifies the OPERABILITY of the CRE boundary by testing for unfiltered air inleakage past the CRE boundary and into the CRE. The details of the testing are specified in the Control Room Envelope Habitability Program.

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more that 5 REM TEDE and the CRE occupants are protected from hazardous chemicals and smoke. There is no automatic CREV actuation for hazardous chemical releases or smoke and there are no Surveillance Requirements to verify the OPERABILITY in cases of hazardous chemicals or smoke. This SR verifies that the unfiltered air inleakage into the CRE is no greater than the flow rate assumed in the licensing basis analysis of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 6) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 7). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load assumed in the safety analyses. The SR consists of a combination of testing and calculation. ~~The 24 month Frequency is appropriate since significant degradation of the Control Room AC System is not expected over this time period.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 10.12.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS

B.1 (continued)

Turbine Bypass System is not required to protect fuel integrity during abnormal operational transients. The 4 hour Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Cycling each main turbine bypass valve through one complete cycle of full travel demonstrates that the valves are mechanically OPERABLE and will function when required. ~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Operating experience has shown that these components usually pass the SR when performed at the 31 day Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.5.2

The Main Turbine Bypass System is required to actuate automatically to perform its design function. This SR demonstrates that, with the required system initiation signals, the valves will actuate to their required position. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the 24 month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.3

This SR ensures that the TURBINE BYPASS SYSTEM RESPONSE TIME is in compliance with the assumptions of the appropriate safety analysis. The response time limits are specified in the cycle specific transient analyses performed to support the preparation of FSAR, Appendix N, Supplemental Reload Licensing Report (Ref. 4). ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the 24 month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 7.11.
2. FSAR, Section 14.5.1.1.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
4. FSAR, Appendix N.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

This SR verifies that sufficient water is available in the event of a fuel handling accident. The water level in the spent fuel storage pool must be checked periodically. ~~The 7 day Frequency is acceptable, based on operating experience, considering that the water volume in the pool is normally stable, and all water level changes are controlled by unit procedures.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 10.3.
2. FSAR, Section 14.6.4.
3. NUREG-0800, Section 15.0.1.
4. 10 CFR 50.67.
5. Regulatory Guide 1.183.
6. FSAR, Section 14.6.4.5.
7. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1 and SR 3.8.1.4 (continued)

SR 3.8.1.4 requires that~~, at a 184 day Frequency,~~ the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions in the design basis LOCA analysis of FSAR, Section 14.6.3 (Ref. 10). The 10 second start requirement is not applicable to SR 3.8.1.1 (see the Note for SR 3.8.1.1), when a modified start procedure as described above is used. If a modified start is not used, the 10 second start requirement of SR 3.8.1.4 applies.

Since SR 3.8.1.4 does require a 10 second start, it is more restrictive than SR 3.8.1.1, and it may be performed in lieu of SR 3.8.1.1. This procedure is the intent of Note 1 of SR 3.8.1.1.

In addition to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor performance.

~~The 31 day Frequency for SR 3.8.1.1 is consistent with Safety Guide 9 (Ref. 3). The 184 day Frequency for SR 3.8.1.4 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2

This Surveillance demonstrates that the DGs are capable of synchronizing and accepting greater than 90 percent of the continuous rating. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0.

~~The 31 day Frequency for this Surveillance is consistent with Safety Guide 9 (Ref. 3).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Note 1 modifies this Surveillance to indicate that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized.

Note 2 modifies this Surveillance by stating that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test.

Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations.

Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.3

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated 7-day storage tank to its associated engine fuel oil tank. It is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

The design of fuel transfer systems is such that pumps that transfer the fuel oil operate automatically in order to maintain an adequate volume of fuel oil in the engine tank during or following DG operation~~. A 31 day Frequency is appropriate, since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.4

See SR 3.8.1.1.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.5 (continued)

The voltage tolerances specified in this SR are based on the degraded voltage and overvoltage relay settings. The frequency tolerances specified in this SR are derived from Safety Guide 9 (Ref. 3) recommendations for response during load sequence intervals. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.5.a corresponds to the maximum frequency excursion, while SR 3.8.1.5.b and 3.8.1.5.c are steady state voltage and frequency values to which the system must recover following load rejection. ~~The 24 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 8).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, the Note requires that, if synchronized to offsite power, testing must be performed using a power factor ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

SR 3.8.1.6

This Surveillance demonstrates that the DG automatically starts from the design basis actuation signal (LOCA signal). This test will also verify the start of the Unit 3 DGs aligned to the SGT and CREV Systems on an accident signal from Unit 1. In order to minimize the number of DGs involved in testing, demonstration of automatic starts of the Unit 3 DGs on an accident signal from Unit 1 may be performed in conjunction

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.6 (continued)

with testing to demonstrate automatic starts of the Unit 3 DGs on an accident signal from Unit 3. ~~Operating experience with these components supports performance of the Surveillance at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

To minimize wear and tear on the DGs, this SR has been modified by a Note which permits DG starts to be preceded by an engine prelube period followed by a warmup period.

SR 3.8.1.7

Demonstration ~~once per 24 months~~ periodically that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours - 22 hours of which is at a load equivalent to the continuous rating of the DG, and 2 hours of which is at a load equivalent to 105 percent to 110 percent of the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube and warmup, discussed in SR 3.8.1.1, and for gradual loading, discussed in SR 3.8.1.2, are applicable to this SR.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor $\leq$ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG could experience. A load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.7 (continued)

~~The 24 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 8).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This Surveillance has been modified by a Note that states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test.

SR 3.8.1.8

Under accident conditions (and loss of offsite power) loads are sequentially connected to the shutdown boards by automatic individual pump timers. The individual pump timers control the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. This SR is demonstrated by performance of SR 3.3.5.1.5 for the Core Spray and LPCI pump timers, SR 3.7.2.3 for the EECW pump timers, and SR 3.8.1.9.b for the 480 V load shed logic timers. The allowable values for these timers ensure that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF shutdown boards.

~~The Frequency of 24 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 8).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

mode of operation. In lieu of actual demonstration of the connection and loading of these loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

~~The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 24 months.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations.

SR 3.8.1.10

This Surveillance is provided to direct that the appropriate Surveillances for the required Unit 3 DGs are governed by the Unit 3 Technical Specifications. Performance of the applicable Unit 3 Surveillances will satisfy any Unit 3 requirements, as well as this Unit 1 and 2 Surveillance requirement. The Frequency required by the applicable Unit 3 SR also governs performance of that SR for both Units.

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter 8.
3. Safety Guide 9.
4. FSAR, Chapter 6.
5. FSAR, Chapter 14.
6. Regulatory Guide 1.93.
7. Generic Letter 84-15.
8. ~~Regulatory Guide 1.9~~Deleted.
9. ANSI C84.1, 1982.
10. FSAR, Section 14.6.3.
11. IEEE Standard 308.
12. FSAR, Section 8.5, Table 8.5-6.
13. FSAR, Section 8.5.2.
14. TVA Design Criteria BFN-50-7082.
15. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at full load. The fuel oil level equivalent to a 7-day supply is 35,280 gallons when calculated in accordance with References 2 and 6. The required fuel storage volume is determined using the most limiting energy content of the stored fuel. Using the known correlation of diesel fuel oil absolute specific gravity or API gravity to energy content, the required diesel generator output, and the corresponding fuel consumption rate, the on site fuel storage volume required for 7 days of operation can be determined. SR 3.8.3.3 requires new fuel to be tested to verify that the absolute specific gravity or API gravity is within the range assumed in the diesel fuel oil consumption calculations. The 7-day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

~~The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.2

This Surveillance ensures that sufficient lubricating oil inventory is available to support at least 7 days of full load operation for each DG. The lube oil inventory equivalent to a 7-day supply is 175 gallons and is based on the DG manufacturer's consumption values for the run time of the DG.

~~A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the plant staff.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.3.4

~~The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Periodic ~~R~~removal of water from the fuel storage tanks ~~once every 31 days~~ eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 2). This SR is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during performance of the Surveillance.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 8.5.3.4.
2. Regulatory Guide 1.137, Revision 1, October 1979.
3. FSAR, Chapter 6.
4. FSAR, Chapter 14.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state, while supplying adequate power to the connected DC loads. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. ~~The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 7).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.4.2 and SR 3.8.4.5

Battery charger capability requirements are based on the design capacity of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 8), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and verification of the charger's ability to recharge the battery ensures that these requirements can be satisfied.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.2 and SR 3.8.4.5 (continued)

SR 3.8.4.2 verifies that the chargers are capable of charging the batteries after their designed duty cycle testing and ensures that the chargers will perform their design function. This SR is modified by a Note that allows the performance of SR 3.8.4.5 in lieu of this Surveillance requirement. SR 3.8.4.5 verifies that the chargers are capable of charging the batteries after each discharge test and ensures that the chargers are capable of performing at maximum output. ~~SR 3.8.4.2 is performed at the same frequency as the 24 month service test (SR 3.8.4.3), while SR 3.8.4.5 is performed following the 60 month battery discharge test (SR 3.8.4.4).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.4.5 is modified by a Note. The Note is added to this SR to acknowledge that credit may be taken for unplanned events that satisfy the Surveillance.

SR 3.8.4.3

A battery service test is a special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 4.

~~The Frequency of 24 months is consistent with the plant conditions required to perform the Surveillance, plus other supporting Surveillance Requirements.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.3 (continued)

This SR is modified by a Note that allows the performance of a modified performance discharge test in lieu of a service test ~~once per 60 months~~. The modified performance discharge test is a simulated duty cycle consisting of just two periods (the one minute rate, followed by the test rate employed for the performance test) or three periods (the one minute rate, followed by the second minute rate followed by the test rate employed for the performance test) both of which envelope the duty cycle of the service test. Since the ampere-hours removed by the rated one or two minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test should remain above the minimum battery terminal voltage specified in the battery service test for the duration of time equal to that of the service test.

A modified discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.4

A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

A battery modified performance discharge test is described in the Bases for SR 3.8.4.3. Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.4.4; however, only the modified performance discharge test may be used to satisfy SR 3.8.4.4 while satisfying the requirements of SR 3.8.4.3 at the same time.

The acceptance criteria for this Surveillance is consistent with IEEE-450 (Ref. 7) and IEEE-485 (Ref. 10). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements.

~~The Frequency for this test is normally 60 months.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to IEEE-450 (Ref. 7), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is 10% below the manufacturer's rating. All these Frequencies are consistent with the recommendations in IEEE-450 (Ref. 7).

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 3), ~~which recommends regular battery inspections (at least one per month)~~ including voltage, specific gravity, and electrolyte temperature of pilot cells. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.6.2

~~The 92 day inspection of specific gravity and voltage is consistent with IEEE-450 (Ref. 3).~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.6.3

This Surveillance verification that the average temperature of representative cells is within limits is consistent with a recommendation of IEEE-450 (Ref. 3) that states that the temperature of electrolytes in representative (10 percent of) cells should be determined ~~on a quarterly basis~~. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on manufacturer's recommendations.

(continued)

BASES

ACTIONS (continued)

G.1 and G.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

H.1

Condition H corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one AC or DC electrical power distribution subsystem is lost, and this results in the loss of a required function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the AC and DC electrical power distribution subsystem is functioning properly, with the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. ~~The 7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, as well as other indications available in the control room that alert the operator to subsystem malfunctions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the AC and DC electrical power distribution subsystem is functioning properly, with the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses~~. The 7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, as well as other indications available in the control room that alert the operator to subsystem malfunctions.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 14.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS

A.1, A.2.1, and A.2.2 (continued)

remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn). It is not the intent of Actions A.2 to eliminate the first performance of SR 3.9.1.1 prior to in-vessel fuel movement. It is expected that the refueling interlocks would be operable except for equipment failure or expiration of the required surveillance interval, and Actions A.2 would not be entered as a convenience for avoiding the first performance of SR 3.9.1.1.

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. This SR is only required for refueling equipment in use.

~~The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

Proper functioning of the refueling position one-rod-out interlock requires the reactor mode switch to be in Refuel. During control rod withdrawal in MODE 5, improper positioning of the reactor mode switch could, in some instances, allow improper bypassing of required interlocks. Therefore, this Surveillance imposes an additional level of assurance that the refueling position one-rod-out interlock will be OPERABLE when required. By "locking" the reactor mode switch in the proper position (i.e., removing the reactor mode switch key from the console while the reactor mode switch is positioned in refuel), an additional administrative control is in place to preclude operator errors from resulting in unanalyzed operation.

~~The Frequency of 12 hours is sufficient in view of other administrative controls utilized during refueling operations to ensure safe operation.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.9.2.2

Performance of a CHANNEL FUNCTIONAL TEST on each channel demonstrates the associated refuel position one-rod-out interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. ~~The 7 day Frequency is considered adequate because of demonstrated~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.2.2 (continued)

~~circuit reliability, procedural controls on control rod withdrawals, and visual and audible indications available in the control room to alert the operator to control rods not fully inserted.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. To perform the required testing, the applicable condition must be entered (i.e., a control rod must be withdrawn from its full-in position). Therefore, SR 3.9.2.2 has been modified by a Note that states the CHANNEL FUNCTIONAL TEST is not required to be performed until 1 hour after any control rod is withdrawn.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section 7.6.3.
3. FSAR, Section 14.5.4.3.
4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

ACTIONS

A.1

With all control rods not fully inserted during the applicable conditions, an inadvertent criticality could occur that is not analyzed in the FSAR. All fuel loading operations must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

During refueling, to ensure that the reactor remains subcritical, all control rods must be fully inserted prior to and during fuel loading. Periodic checks of the control rod position ensure this condition is maintained.

~~The 12 hour Frequency takes into consideration the procedural controls on control rod movement during refueling as well as the redundant functions of the refueling interlocks.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.

2. FSAR, Section 14.5.4.3.

3. FSAR, Section 14.5.4.4.

4. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

ACTIONS

A.1

With one or more withdrawn control rods inoperable, action must be immediately initiated to fully insert the inoperable control rod(s). Inserting the control rod(s) ensures the shutdown and scram capabilities are not adversely affected. Actions must continue until the inoperable control rod(s) is fully inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2

During MODE 5, the OPERABILITY of control rods is primarily required to ensure a withdrawn control rod will automatically insert if a signal requiring a reactor shutdown occurs. Because no explicit analysis exists for automatic shutdown during refueling, the shutdown function is satisfied if the withdrawn control rod is capable of automatic insertion and the associated CRD scram accumulator pressure is ≥ 940 psig.

~~The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. An automatic accumulator monitor may be used to continuously satisfy SR 3.9.5.2.

SR 3.9.5.1 is modified by a Note that allows 7 days after withdrawal of the control rod to perform the Surveillance. This acknowledges that the control rod must first be withdrawn before performance of the Surveillance, and therefore avoids potential conflicts with SR 3.0.3 and SR 3.0.4.

(continued)

BASES (continued)

ACTIONS

A.1

If the water level is < 22 ft above the top of the RPV flange, all operations involving movement of fuel assemblies and handling of control rods within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of fuel movement and control rod handling shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 22 ft above the top of the RPV flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in containment (Ref. 2).

~~The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Regulatory Guide 1.183.
2. FSAR, Section 14.6.4.
3. NUREG-0800, Section 15.0.1.
4. 10 CFR 50.67.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

C.1 and C.2

If no RHR shutdown cooling subsystem is in operation, an alternate method of coolant circulation is required to be established within 1 hour. This alternative method may utilize forced or natural circulation. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR Shutdown Cooling System), the reactor coolant temperature must be periodically monitored to ensure proper functioning of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

This Surveillance demonstrates that the RHR shutdown cooling subsystem is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. ~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 34.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES

ACTIONS (continued)

C.1 and C.2

If no RHR shutdown cooling subsystem is in operation, an alternate method of coolant circulation is required to be established within 1 hour. This alternative method may utilize forced or natural circulation. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR shutdown cooling subsystem), the reactor coolant temperature must be periodically monitored to ensure proper functioning of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.9.8.1

This Surveillance demonstrates that one RHR shutdown cooling subsystem is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability.

~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystems in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 34.
2. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1 and SR 3.10.2.2

Meeting the requirements of this Special Operations LCO maintains operation consistent with or conservative to operating with the reactor mode switch in the shutdown position (or the refuel position for MODE 5). The functions of the reactor mode switch interlocks that are not in effect, due to the testing in progress, are adequately compensated for by the Special Operations LCO requirements. The administrative controls are to be periodically verified to ensure that the operational requirements continue to be met. ~~The Surveillances performed at the 12 hour and 24 hour Frequencies are intended to provide appropriate assurance that each operating shift is aware of and verifies compliance with these Special Operations LCO requirements.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 7.2.3.7.
2. FSAR, Section 14.5.3.3.
3. FSAR, Section 14.5.3.4.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.3.1, SR 3.10.3.2, and SR 3.10.3.3

The other LCOs made applicable in this Special Operations LCO are required to have their Surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed (electrically or hydraulically) while the scram function for the withdrawn rod is not available, periodic verification in accordance with SR 3.10.3.2 is required to preclude the possibility of criticality. SR 3.10.3.2 has been modified by a Note, which clarifies that this SR is not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements, since SR 3.10.3.2 demonstrates that the alternative LCO 3.10.3.d.2 requirements are satisfied. Also, SR 3.10.3.3 verifies that all control rods other than the control rod being withdrawn are fully inserted. ~~The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawal, the protection afforded by the LCOs involved, and hardwire interlocks that preclude additional control rod withdrawals.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 14.5.3.3.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.4.1, SR 3.10.4.2, SR 3.10.4.3, and SR 3.10.4.4

The other LCOs made applicable by this Special Operations LCO are required to have their associated Surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed (electrically or hydraulically) while the scram function for the withdrawn rod is not available, periodic verification is required to ensure that the possibility of criticality remains precluded. Verification that all the other control rods are fully inserted is required to meet the SDM requirements. Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the affected control rod. ~~The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardwire interlocks to preclude an additional control rod withdrawal.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.10.4.2 and SR 3.10.4.4 have been modified by Notes, which clarify that these SRs are not required to be met if the alternative requirements demonstrated by SR 3.10.4.1 are satisfied.

REFERENCES

1. FSAR, Section 14.5.3.3.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.5.1, SR 3.10.5.2, SR 3.10.5.3, SR 3.10.5.4, and SR 3.10.5.5 (continued)

control rod. The Surveillance for LCO 3.1.1, which is made applicable by this Special Operations LCO, is required in order to establish that this Special Operations LCO is being met. Verification that no other CORE ALTERATIONS are being made is required to ensure the assumptions of the safety analysis are satisfied.

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. ~~The 24 hour Frequency is acceptable, given the administrative controls on control rod removal and hardwire interlock to block an additional control rod withdrawal.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 14.5.3.3.

BASES (continued)

ACTIONS

A.1, A.2, A.3.1, and A.3.2

If one or more of the requirements of this Special Operations LCO are not met, the immediate implementation of these Required Actions restores operation consistent with the normal requirements for refueling (i.e., all control rods inserted in core cells containing one or more fuel assemblies) or with the exceptions granted by this Special Operations LCO. The Completion Times for Required Action A.1, Required Action A.2, Required Action A.3.1, and Required Action A.3.2 are intended to require that these Required Actions be implemented in a very short time and carried through in an expeditious manner to either initiate action to restore the affected CRDs and insert their control rods, or initiate action to restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.6.1, SR 3.10.6.2, and SR 3.10.6.3

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. ~~The 24 hour Frequency is acceptable, given the administrative controls on fuel assembly and control rod removal, and takes into account other indications of control rod status available in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. SR 3.10.6.3 is modified by a Note stating that the SR is only required to be met during refueling.

REFERENCES

1. FSAR, Section 14.5.3.3.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.8.1, SR 3.10.8.2, and SR 3.10.8.3

LCO 3.3.1.1, Functions 2.a, 2.d, and 2.e, made applicable in this Special Operations LCO, are required to have applicable Surveillances met to establish that this Special Operations LCO is being met. However, the control rod withdrawal sequences during the SDM tests may be enforced by the RWM (LCO 3.3.2.1, Function 2, MODE 2 requirements) or by a second licensed operator or other qualified member of the technical staff (i.e., personnel trained in accordance with an approved training program for this test). As noted, either the applicable SRs for the RWM (LCO 3.3.2.1) must be satisfied according to the applicable Frequencies (SR 3.10.8.2), or the proper movement of control rods must be verified (SR 3.10.8.3). This latter verification (i.e., SR 3.10.8.3) must be performed during control rod movement to prevent deviations from the specified sequence. These Surveillances provide adequate assurance that the specified test sequence is being followed.

SR 3.10.8.4

Periodic verification of the administrative controls established by this LCO will ensure that the reactor is operated within the bounds of the safety analysis. ~~The 12 hour Frequency is intended to provide appropriate assurance that each operating shift is aware of and verifies compliance with these Special Operations LCO requirements.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.8.5

Coupling verification is performed to ensure the control rod is connected to the control rod drive mechanism and will perform its intended function when necessary. The verification is required to be performed any time a control rod is withdrawn to the "full out" notch position, or prior to declaring the control rod OPERABLE after work on the control rod or CRD System that could affect coupling. This Frequency is acceptable, considering the low probability that a control rod will become uncoupled when it is not being moved as well as operating experience related to uncoupling events.

SR 3.10.8.6

CRD charging water header pressure verification is performed to ensure the motive force is available to scram the control rods in the event of a scram signal. Since the reactor is depressurized in MODE 5, there is insufficient reactor pressure to scram the control rods. Verification of charging water pressure ensures that if a scram is required, capability for rapid control rod insertion would exist. The minimum pressure of 940 psig, which is well below the expected pressure of approximately 1100 psig, ensures sufficient pressure for rapid control rod insertion. ~~The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. NEDE-24011-P-A, Rev. 16, "General Electric Standard Application for Reactor Fuel," October 2007.

2. Letter from T. Pickens (BWROG) to G. C. Lainas, NRC, "Amendment 17 to General Electric Licensing Topical Report NEDE-24011-P-A," August 15, 1986.

(continued)

ATTACHMENT 6

Proposed No Significant Hazards Consideration

Description of the Amendment Request

The Tennessee Valley Authority (TVA) requests the adoption of an approved change to the standard technical specifications (STS) for General Electric BWR/4 Plants (NUREG-1433), to allow relocation of specific Technical Specifications (TS) surveillance frequencies to a licensee-controlled program. The proposed change is described in Technical Specification Task Force (TSTF) Traveler, TSTF-425, Revision 3, (ML090850642) related to the Relocation of Surveillance Frequencies to Licensee Control - Risk-Informed Technical Specifications Task Force (RITSTF) Initiative 5b and was described in the Notice of Availability published in the *Federal Register* on July 6, 2009 (74 FR 31996). TVA has reviewed the proposed no significant hazards consideration determination (NSHC) published with the Notice of Availability, and has concluded that the proposed NSHC is applicable to Browns Ferry Nuclear Plant.

The proposed changes are consistent with Nuclear Regulatory Commission (NRC)-approved Industry/TSTF Traveler, TSTF-425, Revision 3, “Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b.” The proposed change relocates surveillance frequencies to a licensee-controlled program, the Surveillance Frequency Control Program (SFCP). This change is applicable to licensees using probabilistic risk guidelines contained in NRC-approved Nuclear Energy Institute (NEI) 04-10, “Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies” (ML071360456).

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

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

   Response: No.

   The proposed change relocates the specified frequencies for periodic surveillance requirements to licensee control under a new SFCP. Surveillance frequencies are not an initiator to any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The systems and components required by the technical specifications for which the surveillance frequencies are relocated are still required to be operable, meet the acceptance criteria for the surveillance requirements, and be capable of performing any mitigation function assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly increased.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No.

   No new or different accidents result from utilizing the proposed change. The change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the change does not impose any new or different requirements. The change does not alter assumptions made in the safety analysis. The proposed change is consistent with the safety analysis assumptions and current plant operating practice.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. *Do the proposed changes involve a significant reduction in a margin of safety?*

   Response: No.

   The design, operation, testing methods, and acceptance criteria for structures, systems, components, specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plant licensing basis (including the final safety analysis report and bases to TS), because these are not affected by changes to the surveillance frequencies. Similarly, there is no effect to safety analysis acceptance criteria as described in the plant licensing basis. To evaluate a change in the relocated surveillance frequency, TVA will perform a probabilistic risk evaluation using the guidance contained in NRC approved NEI 04-10, Revision 1, in accordance with the TS SFCP. This methodology provides reasonable acceptance guidelines and methods for evaluating the risk increase of proposed changes to surveillance frequencies consistent with Regulatory Guide 1.177.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, TVA concludes that the requested change does not involve a significant hazards consideration as set forth in 10 CFR 50.92(c), Issuance of Amendment.

Attachment 7 to CNL-20-003

TSTF-425 (NUREG-1433) Versus BFN TS Cross-Reference
(33 pages)

TSTF-425 vs. BFN Cross-Reference

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
1.1	Staggered Test Basis put in brackets	1.1	Retained Staggered Test Basis definition.	No variation
3.1.3	**Control Rod Operability**	**3.1.3**	**Control Rod Operability**	
3.1.3.1	Determine the position of each control rod.	3.1.3.1	Determine the position of each control rod.	No variation
3.1.3.2	Insert each fully withdrawn control rod at least one notch.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.1.3.3	Insert each partially withdrawn control rod at least one notch.	3.1.3.3	Insert each withdrawn control rod at least one notch.	Administrative Variation - Section 2.2.1.1
3.1.4	**Control Rod Scram Times**	**3.1.4**	**Control Rod Scram Times**	
3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ [800] psig.	3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	No variation
3.1.5	**Control Rod Scram Accumulators**	**3.1.5**	**Control Rod Scram Accumulators**	
3.1.5.1	Verify each control rod scram accumulator pressure is ≥ [940] psig.	3.1.5.1	Verify each control rod scram accumulator pressure is ≥ 940 psig.	No variation
3.1.6	**Rod Pattern Control**	**3.1.6**	**Rod Pattern Control**	
3.1.6.1	Verify all OPERABLE control rods comply with [BPWS].	3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	No variation
3.1.7	**SLC System**	**3.1.7**	**SLC System**	
3.1.7.1	Verify available volume of sodium pentaborate solution is [within the limits of Figure 3.1.7-1, or ≥ [4530] gallons].	3.1.7.1	Verify available volume of sodium pentaborate solution (SPB) is ≥ 4000 gallons.	Administrative Variation - Section 2.2.1.1
3.1.7.2	[Verify temperature of sodium pentaborate solution is within the limits of [Figure 3.1 -7-2].	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.1.7.3	[Verify temperature of pump suction piping is within the limits of [Figure 3.1.7-21.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.1.7.4	Verify continuity of explosive charge.	3.1.7.2	Verify continuity of explosive charge.	Administrative Variation - Section 2.2.1.1
N/A	N/A	3.1.7.3	Verify the SPB concentration is > 8.0% by weight.	Administrative Variation Section 2.2.1.5

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
N/A	N/A	3.1.7.4	Verify the SPB concentration is < 9.2% by weight. <u>OR</u> Verify the concentration and temperature of boron in solution are within the limits of Figure 3.1.7-1.	Administrative Variation Section 2.2.1.5
3.1.7.5	Verify the concentration of boron in solution is [within the limits of Figure 3.1.7-l].	N/A	N/A	Administrative Variation - Section 2.2.1.2
N/A	N/A	3.1.7.5	Verify the minimum quantity of Boron-10 in the SLC solution tank and available for injection is ≥ 203 pounds.	Administrative Variation Section 2.2.1.5
3.1.7.6	Verify each SLC subsystem manual, power operated, [and automatic valve] in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	3.1.7.11	Verify each SLC subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	Administrative Variation - Section 2.2.1.1
N/A	N/A	3.1.7.6	Verify the SLC conditions satisfy the following 31 days equation:	Administrative Variation - Section 2.2.1.5
3.1.7.7	Verify each pump develops a flow rate ≥ [41.2] gpm at a discharge pressure ≥ [1190] psig.	3.1.7.7	Verify each pump develops a flow rate ≥ 39 gpm at a discharge pressure ≥ 1325 psig.	No variation
3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	No variation
3.1.7.9	[Verify all heat traced piping between storage tank and pump suction is unblocked.	3.1.7.9	Verify all piping between storage tank and pump suction is unblocked.	Administrative Variation - Section 2.2.1.1
N/A	N/A	3.1.7.10	Verify sodium pentaborate enrichment is within the limits established by SR 3.1.7.6 by calculating within 24 hours and verifying by analysis within 30 days.	Administrative Variation Section 2.2.1.5
3.1.8	**SDV Vent and Drain Valves**	**3.1.8**	**SDV Vent and Drain Valves**	
3.1.8.1	Verify each SDV vent and drain valve is open.	3.1.8.1	Verify each SDV vent and drain valve is open.	No variation
3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ [60] seconds after receipt of an actual or simulated scram signal and b. Opens when the actual or simulated scram signal is reset.	3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 60 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	No variation
3.2.1	**Average Planar Linear Heat Generation Rate**	**3.2.1**	**Average Planar Linear Heat Generation Rate**	
3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	No variation
3.2.2	**Minimum Critical Power Ratio**	**3.2.2**	**Minimum Critical Power Ratio**	
3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	No variation
3.2.3	**Linear Heat Generation Rate**	**3.2.3**	**Linear Heat Generation Rate**	
3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	No variation
3.2.4	**APRM Gain and Setpoints**	**N/A**	**N/A**	
3.2.4.1	Verify MFLPD is within limits.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.2.4.2	Verify APRM setpoints or gains are adjusted for the calculated MFLPD.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.1.1	**RPS Instrumentation**	**3.3.1.1**	**RPS Instrumentation**	
3.3.1.1.1	Perform CHANNEL CHECK. [Function 1.a, 2.a/b/c, 3, 4, 6, 7.a]	3.3.1.1.1	Perform CHANNEL CHECK. [Function 1.a, 2a/b/c/e/f, 3, 4]	Administrative Variation - Section 2.2.1.3
3.3.1.1.2	Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2 2% RTP [plus any gain adjustment required by LC0 3.2.4, “Average Power Range Monitor (APRM) Setpoints”] while operating at ≥ 25% RTP. [Function 2.b/c	3.3.1.1.2	Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP. [Function 2.b/c]	Administrative Variation - Section 2.2.1.3
3.3.1.1.3	Adjust the channel to conform to a calibrated flow signal. [Function 2.b]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b, 2.a]	3.3.1.1.3 3.3.1.1.16	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b] Perform CHANNEL FUNCTIONAL TEST. [Function 2.a/b/c/d/e/f]	Administrative Variation - Section 2.2.1.3

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b, 11]	3.3.1.1.4	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]	Technical Variation - Section 2.2.2.1
N/A	N/A	3.3.1.1.6	Verify the IRM and APRM channels overlap. [Function 1.a, 2.a]	Administrative Variation Section 2.2.1.5
3.3.1.1.6	Calibrate the local power range monitors. [Function 2.a/b/c/d/e]	3.3.1.1.7	Calibrate the local power range monitors. Function 2.a/b/c/e]	Administrative Variation - Section 2.2.1.3
3.3.1.1.7	Perform CHANNEL FUNCTIONAL TEST. [Function 2.b/c/d, 3, 4, 5, 6, 7.a/b, 8, 9]	3.3.1.1.8	~~Perform CHANNEL FUNCTIONAL TEST. [Function 3, 4, 5, 6, 7.a/b, 8, 9, 11]~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.1.1.8	[Calibrate the trip units. [Function 3, 4, 6, 7.a, 8, 9]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.1.1.9	Perform CHANNEL CALIBRATION. [Function 2.a/b/c]	3.3.1.1.10 3.3.1.1.13	Perform CHANNEL CALIBRATION. [Function 2.a/b/f, 4, 5, 6, 7a/b, 8] Perform CHANNEL CALIBRATION [Function 3]	Administrative Variation - Section 2.2.1.3
3.3.1.1.10	Perform CHANNEL FUNCTIONAL TEST. [Function 10]	3.3.1.1.12	~~Perform CHANNEL FUNCTIONAL TEST. [Function 10]~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.1.1.11	Perform CHANNEL CALIBRATION. [Function 1.a, 3, 4, 5, 6, 7.a/b, 8, 9]	3.3.1.1.9	Perform CHANNEL CALIBRATION. [Function 1.a]	Administrative Variation - Section 2.2.1.3
3.3.1.1.12	Verify the APRM Flow Biased Simulated Thermal Power - High time constant is ≤ [7] seconds. [Function 2.b]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.1.1.13	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function1.a/b, 2.a/b/c/d/e, 3, 4, 5, 6, 7.a/b, 8, 9, 10, 11]	3.3.1.1.14	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function1.a/b, 2.e, 3, 4, 5, 6, 7.a/b, 8, 9, 10, 11]	Administrative Variation - Section 2.2.1.3
3.3.1.1.14	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure – Low Functions are not bypassed when THERMAL POWER is ≥ [30]% RTP. [Function 8, 9]	3.3.1.1.15	Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure- Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP. [Function 8, 9]	Administrative Variation - Section 2.2.1.3
3.3.1.1.15	Verify the RPS RESPONSE TIME is within limits. [Function 2.b/c, 3, 4, 5, 8, 9]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.1.2	**SRM Instrumentation**	**3.3.1.2**	**SRM Instrumentation**	
3.3.1.2.1	Perform CHANNEL CHECK [Mode 2, 5].	3.3.1.2.1	Perform CHANNEL CHECK [Mode 2, 3, 4, 5].	Technical Variation – Section 2.2.2.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.1.2.2	Verify an OPERABLE SRM detector is located in: a. The fueled region, b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region, and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	3.3.1.2.2	Verify an OPERABLE SRM detector is 12 hours located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	No variation
3.3.1.2.3	Perform CHANNEL CHECK [Mode 3, 4]	3.3.1.2.3	~~Perform CHANNEL CHECK.~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.1.2.4	Verify count rate is: a. ≥ [3.0] cps with a signal to noise ratio ≥ [2:1] or b. ≥ [0.7] cps with a signal to noise ratio ≥ [20:1].	3.3.1.2.4	Verify count rate is ≥ 3.0 cps with a signal to noise ratio ≥ 3:1.	Administrative Variation - Section 2.2.1.3
3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio].	3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	No variation
3.3.1.2.6	Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio].	3.3.1.2.6	Perform CHANNEL FUNCTIONAL TEST determination of signal to noise ratio.	No variation
3.3.1.2.7	Perform CHANNEL CALIBRATION.	3.3.1.2.7	Perform CHANNEL CALIBRATION.	No variation
3.3.2.1	**Control Rod Block Instrumentation**	**3.3.2.1**	**Control Rod Block Instrumentation**	
3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b/c/d/e]	3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b/c/d/e]	No variation
3.3.2.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 2]	3.3.2.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 2]	No variation
3.3.2.1.3	Perform CHANNEL FUNCTIONAL TEST. [Function 2]	3.3.2.1.3	Perform CHANNEL FUNCTIONAL TEST. [Function 2]	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.2.1.4	Verify the RBM: a. Low Power Range - Upscale Function is not bypassed when THERMAL POWER is ≥ 29% and ≤ 64% RTP. b. Intermediate Power Range - Upscale Function is not bypassed when THERMAL POWER is > 64% and ≤ 84% RTP. c. High Power Range - Upscale Function is not bypassed when THERMAL POWER is > 84% RTP. [Function 1.a/b/c]	3.3.2.1.8	Verify the RBM: a. Low Power Range **-** Upscale Function is not bypassed when THERMAL POWER is ≥ 27% and ≤ 62% RTP. b. Intermediate Power Range – Upscale Function is not bypassed when THERMAL POWER is > 62% and ≤82% RTP. c. High Power Range - Upscale Function is not bypassed when THERMAL POWER is **>** 82% RTP. [Function 1.a/b/c]	Administrative Variation - Section 2.2.1.3
3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ [10]% RTP. [Function 2]	3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP. [Function 2]	No variation
3.3.2.1.6	Perform CHANNEL FUNCTIONAL TEST. [Function 3]	3.3.2.1.6	Perform CHANNEL FUNCTIONAL TEST. [Function 3	No variation
3.3.2.1.7	Perform CHANNEL CALIBRATION. [Function 1.a/b/c/e/f]	3.3.2.1.4	Perform CHANNEL CALIBRATION. [Function 1.a/b/c/e]	Administrative Variation - Section 2.2.1.3
3.3.2.2	**Feedwater and Main Turbine High Water Level Trip Instrumentation**	**3.3.2.2**	**Feedwater and Main Turbine High Water Level Trip Instrumentation**	
3.3.2.2.1	[Perform CHANNEL CHECK	3.3.2.2.1	Perform CHANNEL CHECK	No variation
3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST	3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST	No variation
3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ [58.0] inches.	3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 586 inches above vessel zero.	Administrative Variation - Section 2.2.1.3
3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including [valve] actuation.	3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	No variation
3.3.3.1	**Post Accident Monitoring (PAM) Instrumentation**	**3.3.3.1**	**PAM Instrumentation**	
3.3.3.1.1	Perform CHANNEL CHECK.	3.3.3.1.1	Perform CHANNEL CHECK for each required PAM instrumentation channel.	Administrative Variation - Section 2.2.1.3
3.3.3.1.2	Perform CHANNEL CALIBRATION.	3.3.3.1.3	Perform CHANNEL CALIBRATION~~ of the Reactor Pressure Functions~~.	Technical Variation - Section 2.2.2.3
N/A	N/A	~~3.3.3.1.4~~	~~Perform CHANNEL CALIBRATION for each required PAM instrumentation channel except for the Reactor Pressure Function.~~	Technical Variation – Section 2.2.2.3

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.3.2	**Remote Shutdown System**	**3.3.3.2**	**Backup Control System**	
3.3.3.2.1	[Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.3.3.2.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	3.3.3.2.1	Verify each required control circuit and transfer switch is capable of performing the intended function.	Administrative Variation - Section 2.2.1.3
3.3.3.2.3	Perform CHANNEL CALIBRATION for each required instrumentation channel.	3.3.3.2.2	Perform CHANNEL CALIBRATION for ~~the Suppression Pool Water Level Function~~each required instrumentation channel.	Technical Variation - Section 2.2.2.4
N/A	N/A	~~3.3.3.2.3~~	~~Perform CHANNEL CALIBRATION for each required instrumentation channel except for the Suppression Pool Water Level Function.~~	Technical Variation - Section 2.2.2.4
3.3.4.1	**EOC-RPT Instrumentation**	**3.3.4.1**	**EOC-RPT Instrumentation**	
3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	No variation
3.3.4.1.2	[Calibrate the trip units.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. TSV - Closure: ≤ [10]% closed and b. TCV Fast Closure, Trip Oil Pressure - Low: ≥ [600] psig.	3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: ≤ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: ≥ 550 psig.	No variation
3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	No variation
3.3.4.1.5	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ [30]% RTP.	3.3.4.1.2	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	Administrative Variation – Section 2.2.1.1
3.3.4.1.6	Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.3.4.1.7	Determine RPT breaker [interruption] time.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.3.4.2	ATWS-RPT Instrumentation	3.3.4.2	ATWS-RPT Instrumentation	
3.3.4.2.1	[Perform CHANNEL CHECK.	3.3.4.2.1	Perform CHANNEL CHECK of the Reactor Vessel Water Level - Low Low, Level 2 Function.	Administrative Variation - Section 2.2.1.3

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	3.3.4.2.2	Perform CHANNEL FUNCTIONAL TEST.	No variation
3.3.4.2.3	[Calibrate the trip units.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.3.4.2.4	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ [-47] inches and b. Reactor Steam Dome Pressure - High: ≤ [1095] psig.	3.3.4.2.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level - Low Low, Level 2: ≥ 471.52 inches above vessel zero; and b. Reactor Steam Dome Pressure – High: ≤ 1175 psig.	Administrative Variation - Section 2.2.1.3
3.3.4.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	3.3.4.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	Administrative Variation - Section 2.2.1.3
3.3.5.1	**ECCS Instrumentation**	**3.3.5.1**	**ECCS Instrumentation**	
3.3.5.1.1	Perform CHANNEL CHECK. [Function 1.a/b/c/d, 2.a/b/c/d/e/g, 3.a/b/c/d/e/f, 4.a/b/d/e/f, 5.a/b/d/e/f]	3.3.5.1.1	Perform CHANNEL CHECK. [Function 1.a, 2.a/e, 3.a/c, 4.a/d, 5.a/d]	Administrative Variation - Section 2.2.1.3
3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b/c/d, 2.a/b/c/d/e/g, 3.a/b/c/d/e/f, 4.a/b/d/e/f, 5.a/b/d/e/f]	3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b/c/d, 2.a/b/c/d/e, 3.a/b/c/d/e/f, 4.a/b/d/e/f, 5.a/b/d/e/f]	Administrative Variation - Section 2.2.1.3
3.3.5.1.3	[Calibrate the trip unit. [Function 1.a/b/c, 2.a/b/c/d/e, 3.a/b/c/e, 4.a/b/d/e/f, 5.a/b/d/e/f	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.5.1.4	[Perform CHANNEL CALIBRATION. [Function 3.d]	3.3.5.1.3	Perform CHANNEL CALIBRATION. [Function 1.a/b/c/d/e, 2.a/b/c/d/e/f, 3.a/b/c/d/e/f, 4.a/b/c/d/e/f/g, 5.a/b/c/d/e/f/g]	Technical Variation - Section 2.2.2.1
N/A	N/A	3.3.5.1.4	~~Perform CHANNEL CALIBRATION. [Function 1.c, 2.c/d]~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.5.1.5	Perform CHANNEL CALIBRATION. [Function 1.a/b/c/d, 2.a/b/c/d/e/f/g, 3.a/b/c/e/f, 4.a/b/c/d/e/f/g, 5.a/b/c/d/e/f/g]	3.3.5.1.5	~~Perform CHANNEL CALIBRATION. [Function 1.a/b/e, 2.a/b/e/f, 3.a/b/c/f, 4.a/b/c/d/g, 5.a/b/c/d/g]~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1.a/b/c/d/e, 2.a/b/c/d/e/f/g/h, 3.a/b/c/d/e/f/g, 4.a/b/c/d/e/f/g/h, 5.a/b/c/d/e/f/g/h]	3.3.5.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1.a/b/c/e, 2.a/b/c/d/e/f, 3.a/b/c/d/e/f, 4.a/b/c/d/e/f/g, 5.a/b/c/d/e/f/g]	Administrative Variation - Section 2.2.1.3
3.3.5.1.7	Verify the ECCS RESPONSE TIME is within limits. [Function 1.a/b/c, 2.a/b/c, 3.a/b/c]	N/A	N/A	Administrative Variation - Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
N/A	N/A	3.3.5.2	**RPV Water Inventory Control Instrumentation**	
N/A	N/A	3.3.5.2.1	Perform CHANNEL CHECK	Administrative Variation – Section 2.2.1.5
N/A	N/A	3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST	Administrative Variation – Section 2.2.1.5
3.3.5.2	**RCIC System Instrumentation**	3.3.5.3	**RCIC System Instrumentation**	
3.3.5.2.1	Perform CHANNEL CHECK. [Function 1, 2, 3, 4]	3.3.5.3.1	Perform CHANNEL CHECK. [Function 1, 2]	Administrative Variation - Section 2.2.1.3
3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2, 3, 4]	3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2]	Administrative Variation - Section 2.2.1.3
3.3.5.2.3	[Calibrate the trip units. [Function 1, 2, 3, 4]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.5.2.4	[Perform CHANNEL CALIBRATION. [Function 3	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.5.2.5	Perform CHANNEL CALIBRATION. [Function 1, 2, 4]	3.3.5.3.3	Perform CHANNEL CALIBRATION. [Function 1, 2]	Administrative Variation - Section 2.2.1.3
3.3.5.2.6	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3, 4, 5]	3.3.5.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2]	Administrative Variation - Section 2.2.1.3
3.3.6.1	**Primary Containment Isolation Instrumentation**	**3.3.6.1**	**Primary Containment Isolation Instrumentation**	
3.3.6.1.1	Perform CHANNEL CHECK. [Functions 1.a/b/c/d/e/f/g, 2.a/b/c/d/e, 3a/b/c/d/e/f/h/i, 4.a/b/c/d/e/g/h/i/j, 5.a/b/c/e, 6.a/b, 7.a/b]	3.3.6.1.1	Perform CHANNEL CHECK. [Functions 1.a/c, 2.a, 5.h, 6.b]	Administrative Variation - Section 2.2.1.3
3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST. [Functions 1.a/b/c/d/e/f/g, 2.a/b/c/d/e, 3a/b/c/d/e/f/h/i, 4.a/b/c/d/e/g/h/i/j, 5.a/b/c/e, 6.a/b, 7.a/b]	3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST. [Functions 1.a/b/c/d, 2.a/b, 3a/b/c/d/e/f/g, 4.a/b/c/d/e/f/g, 5.a/b/c/d/e/f/h, 6.a/b/c]	Administrative Variation - Section 2.2.1.3
3.3.6.1.3	[Calibrate the trip unit. [Function 1.a/c/e/f, 2.a/b, 3.a/b/c/d/e/f/h/I, 4.a/b/c/d/e/g/h/i/j, 5.b/c/e, 6.a/b, 7.a/b]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.1.4	Perform CHANNEL CALIBRATION. [Function 1.b/d, 4.i/j]	N/A	N/A	Administrative Variation - Section 2.2.1.2
N/A	N/A	3.3.6.1.3	~~Perform CHANNEL CALIBRATION.~~ (Deleted)	Technical Variation - Section 2.2.2.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
N/A	N/A	3.3.6.1.4	~~Perform CHANNEL CALIBRATION.~~ (Deleted)	Technical Variation - Section 2.2.2.2
3.3.6.1.5	Perform CHANNEL FUNCTIONAL TEST. [Function 3.g, 4.f]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.1.6	Perform CHANNEL CALIBRATION. [Functions 1.a/c/e/f/g, 2.a/b/c/d/e, 3a/b/c/d/e/f/g/h/i, 4.a/b/c/d/e/f/g/h, 5.a/b/c/e, 6.a/b, 7.a/b]	3.3.6.1.5	Perform CHANNEL CALIBRATION. [Function 1.a/b/c/d, 2.a/b, 3.a/b/c/d/e/f/g, 4.a/b/c/d/e/f/g, 5.a/b/c/d/e/f/h, 4.a/b/c]	Administrative Variation - Section 2.2.1.3
3.3.6.1.7	Perform LOGIC SYSTEM FUNCTIONAL TEST [Function 1.a/b/c/d/e/f/g/h, 2.a/b/c/d/e/f, 3.a/b/c/d/e/f/g/h/i/j, 4.a/b/c/d/e/f/g/h/i/j/k, 5.a/b/c/d/e/f, 6.a/b, 7.a/b]	3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST [Function 1.a/b/c/d, 2.a/b/c/d/e/f, 3.a/b/c/d/e/f/g, 4.a/b/c/d/e/f/g, 5.a/b/c/d/e/f/g/h, 6.a/b/c]	Administrative Variation - Section 2.2.1.3
3.3.6.1.8	Verify ISOLATION SYSTEM RESPONSE TIME is within limits. [Function 1.a/b/c/e, 2.a/b/d/e, 3.a/b/d, 4.a/d, 5.a/b/c/e]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.2	**Secondary Containment Isolation Instrumentation**	**3.3.6.2**	**Secondary Containment Isolation Instrumentation**	
3.3.6.2.1	Perform CHANNEL CHECK [Function 1, 2, 3, 4]	3.3.6.2.1	Perform CHANNEL CHECK [Function 1, 3, 4]	Administrative Variation - Section 2.2.1.3
3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2, 3, 4]	3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2, 3, 4]	No variation
3.3.6.2.3	[Calibrate the trip unit. [Function 1, 2]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.2.4	[Perform CHANNEL CALIBRATION. [Function 4]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.2.5	Perform CHANNEL CALIBRATION. [Function 1, 2, 3]	3.3.6.2.3	Perform CHANNEL CALIBRATION. [Function 1, 2, 3, 4]	Administrative Variation - Section 2.2.1.3
3.3.6.2.6	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3, 4, 5]	3.3.6.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3, 4]	Administrative Variation - Section 2.2.1.3
3.3.6.2.7	Verify the ISOLATION SYSTEM RESPONSE TIME is within limits. [Function 1, 2, 3, 4]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.3	**Low-Low Set (LLS) Instrumentation**	**N/A**	**N/A**	
3.3.6.3.1	Perform CHANNEL CHECK. [Function 1, 2, 3]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.3.2	Perform CHANNEL FUNCTIONAL TEST for portion of the channel outside primary containment. [Function 3]	N/A	N/A	Administrative Variation - Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.6.3.3	Perform CHANNEL FUNCTIONAL TEST for portions of the channel inside primary containment. [Function 3]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.3.4	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.3.5	[Calibrate the trip unit. [Function 1, 2]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.3.6	Perform CHANNEL CALIBRATION. [Function 1, 2, 3]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.6.3.7	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.7.1	**[Main Control Room Environmental Control (MCREC)] System Instrumentation**	**3.3.7.1**	**Control Room Emergency Ventilation (CREV) System Instrumentation**	
3.3.7.1.1	Perform CHANNEL CHECK. [Functions 1, 2, 3, 4, 5]	3.3.7.1.1	Perform CHANNEL CHECK. [Function 1, 3, 4, 5]	Administrative Variation - Section 2.2.1.3
3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2, 3, 4, 5]	3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1, 2, 3, 4, 5]	No variation
3.3.7.1.3	[Calibrate the trip units. [Function 1, 2, 3]	N/A	N/A	Administrative Variation - Section 2.2.1.2
N/A	N/A	3.3.7.1.3	Perform CHANNEL CALIBRATION. [Function 1, 2, 3, 4, 5]	Technical Variation - Section 2.2.2.1
N/A	N/A	3.3.7.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3, 4, 5]	Technical Variation - Section 2.2.2.1
3.3.7.1.4	Perform CHANNEL CALIBRATION. [Function 1, 2, 3, 4, 5]	3.3.7.1.5	~~Perform CHANNEL CALIBRATION. [Function 1, 2, 3, 4]~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.7.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3, 4, 5]	3.3.7.1.6	~~Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1, 2, 3, 4]~~ (Deleted)	Technical Variation - Section 2.2.2.1.
3.3.8.1	**Loss of Power (LOP) Instrumentation**	**3.3.8.1**	**LOP Instrumentation**	
3.3.8.1.1	Perform CHANNEL CHECK. [Function 1.a, 2.a]	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.3.8.1.2	Perform CHANNEL FUNCTIONAL TEST. [Function 1.a/b, 2.a/b]	N/A	N/A	Administrative Variation - Section 2.2.1.2
N/A	N/A	3.3.8.1.1	Perform CHANNEL CALIBRATION. [Function 1.a/b, 2.a/b.1/2/3/4, 3]	Technical Variation - Section 2.2.2.1
3.3.8.1.3	Perform CHANNEL CALIBRATION. [Function 1.a/b, 2.a/b]	3.3.8.1.2	~~Perform CHANNEL CALIBRATION. [Function 1.a/b, 2.b.1/2/3/4, 3]~~ (Deleted)	Technical Variation - Section 2.2.2.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.3.8.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1.a/b, 2.a/b]	3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST. [Function 1.a/b, 2.a, 2.b.1/2/3/4]	Administrative Variation - Section 2.2.1.3
3.3.8.2	**Reactor Protection System (RPS) Electric Power Monitoring**	**3.3.8.2**	**RPS Electric Power Monitoring**	
3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	3.3.8.2.1	Perform CHANNEL FUNCTIONAL TEST.	No variation
3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ [132] V. b. Undervoltage ≥ [108] V, with time delay set to [zero]. c. Underfrequency ≥ [57] Hz, with time delay set to [zero].	3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V, with time delay set to ≤ 4 seconds. b. Undervoltage ≥ 108.5 V, with time delay set to ≤ 4 seconds. c. Underfrequency ≥ 56 Hz, with time delay set to ≤ 4 seconds.	Administrative Variation - Section 2.2.1.3
3.3.8.2.3	Perform a system functional test	3.3.8.2.3	Perform a system functional test	No variation
3.4.1	**Recirculation Loops Operating**	**3.4.1**	**Recirculation Loops Operating**	
3.4.1.1	Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ [10]% of rated core flow when operating at < [70]% of rated core flow and b. ≤ [5]% of rated core flow when operating at ≥ [70]% of rated core flow.	3.4.1.1	Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	No variation
3.4.2	**Jet Pumps**	**3.4.2**	**Jet Pumps**	
3.4.2.1	Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	3.4.2.1	Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. Each jet pump flow differs by ≤ 10% from established patterns.	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.4.3	**Safety/Relief Valves (S/RVs)**	**3.4.3**	**S/RVs**	
3.4.3.1	Verify the safety function lift setpoints of the [required] S/RVs are as follows: Number of S/RVs — Setpoint (psig) [4] — [1090 ± 32.7] [4] — [1100 ± 33.0] [3] — [1110 ± 33.3] Following testing, lift settings shall be within ± 1%.	3.4.3.1	Verify the safety function lift setpoints of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	Administrative Variation - Section 2.2.1.4
3.4.3.2	Verify each [required] S/RV opens when manually actuated.	3.4.3.2	Verify each required S/RV opens when manually actuated.	No variation
3.4.4	**RCS Operational LEAKAGE**	**3.4.4**	**RCS Operational LEAKAGE**	
3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	No variation
3.4.5	**RCS Pressure Isolation Valve (PIV) Leakage**	**N/A**	**N/A**	
3.4.5.1	Verify equivalent leakage of each RCS PIV is ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm, at an RCS pressure [ ] and ≤ [ ] psig.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.4.6	**RCS Leakage Detection Instrumentation**	**3.4.5**	**RCS Leakage Detection Instrumentation**	
3.4.6.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system.	3.4.5.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system instrumentation.	Administrative Variation - Section 2.2.1.1
3.4.6.2	Perform a CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation.	3.4.5.2	Perform a CHANNEL FUNCTIONAL TEST of required primary containment atmospheric monitoring system instrumentation.	Administrative Variation - Section 2.2.1.1
N/A	N/A	3.4.5.3	Perform a CHANNEL CALIBRATION of required drywell sump flow integrator instrumentation.	Administrative Variation - Section 2.2.1.5
3.4.6.3	Perform a CHANNEL CALIBRATION of required leakage detection instrumentation	3.4.5.4	Perform a CHANNEL CALIBRATION of required leakage detection system instrumentation.	Administrative Variation - Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.4.7	**RCS Specific Activity**	**3.4.6**	**RCS Specific Activity**	
3.4.7.1	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ [0.2] μCi/gm.	3.4.6.1	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 3.2 μCi/gm.	Administrative Variation - Section 2.2.1.1
3.4.8	**RHR Shutdown Cooling System – Hot Shutdown**	**3.4.7**	**RHR Shutdown Cooling System – Hot Shutdown**	
3.4.8.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	3.4.7.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	Administrative Variation - Section 2.2.1.1
3.4.9	**RHR Shutdown Cooling System – Cold Shutdown**	**3.4.8**	**RHR Shutdown Cooling System – Cold Shutdown**	
3.4.9.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	3.4.8.1	Verify one required RHR shutdown cooling subsystem or recirculation pump is operating.	Administrative Variation - Section 2.2.1.1
3.4.10	RCS Pressure and Temperature (P/T) Limits	**3.4.9**	**RCS P/T Limits**	
3.4.10.1	Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.	3.4.9.1	Verify: a. RCS pressure and RCS temperature are within the limits specified by Curves No. 1 and No. 2 of Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	Administrative Variation - Section 2.2.1.1
3.4.10.7	Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR.	3.4.9.5	Verify reactor vessel flange and head flange temperatures are > 83°F.	Administrative Variation - Section 2.2.1.1
3.4.10.8	Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR.	3.4.9.6	Verify reactor vessel flange and head flange temperatures are > 83°F.	Administrative Variation - Section 2.2.1.1
3.4.10.9	Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR.	3.4.9.7	Verify reactor vessel flange and head flange temperatures are > 83°F.	Administrative Variation - Section 2.2.1.1
3.4.11	**Reactor Steam Dome Pressure**	**3.4.10**	**Reactor Steam Dome Pressure**	
3.4.11.1	Verify reactor steam dome pressure is ≤ [1020] psig.	3.4.10.1	Verify reactor steam dome pressure is ≤ 1050 psig.	Administrative Variation - Section 2.2.1.1
3.5.1	**ECCS - Operating**	**3.5.1**	**ECCS - Operating**	
3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from	3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
	the pump discharge valve to the injection valve.		from the pump discharge valve to the injection valve.	
3.5.1.2	Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	3.5.1.2	Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	No variation
3.5.1.3	Verify ADS [air supply header] pressure is ≥ [90] psig.	3.5.1.3	Verify ADS air supply header pressure is ≥ 81 psig.	No variation
3.5.1.4	[Verify the [RHR] System cross tie valve[s] [is] closed and power is removed from the valve operator[s].	N/A (Unit 1) 3.5.1.4 (Unit 2/3) 3.5.1.4 (Unit 3)	N/A (Unit 1) Verify the LPCI cross tie valve is closed and power is removed from the valve operator. or Verify the manual shutoff valve in the LPCI cross tie is closed.	Administrative Variation - Section 2.2.1.2 No variation Administrative Variation – Section 2.2.1.5
3.5.1.5	[Verify each LPCI inverter output voltage is ≥ [570] V and ≤ [630] V while supplying the respective bus.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.5.1.7	Verify the following ECCS pumps develop the specified flow rate [against a system head corresponding to the specified reactor pressure].	3.5.1.6	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified pressure.	Administrative Variation - Section 2.2.1.4
3.5.1.8	Verify, with [reactor pressure] ≤ [1020] and ≥ [920] psig, the HPCI pump can develop a flow rate ≥ [4250] gpm [against a system head corresponding to reactor pressure].	3.5.1.7	Verify, with reactor pressure ≤ 1040 and ≥ 950 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	Administrative Variation - Section 2.2.1.1
3.5.1.9	Verify, with [reactor pressure] ≤ [165] psig, the HPCI pump can develop a flow rate ≥ [4250] gpm [against a system head corresponding to reactor pressure].	3.5.1.8	Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	Administrative Variation - Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.5.1.10	Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	3.5.1.9	Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	Administrative Variation - Section 2.2.1.1
3.5.1.11	Verify the ADS actuates on an actual or simulated automatic initiation signal.	3.5.1.10	Verify the ADS actuates on an actual or simulated automatic initiation signal.	Administrative Variation - Section 2.2.1.
3.5.1.12	Verify each ADS valve opens when manually actuated.	3.5.1.11	Verify each ADS valve opens when manually actuated.	Administrative Variation - Section 2.2.1.1
3.5.2	**ECCS - Shutdown**	**3.5.2**	**RPV Water Inventory Control**	
N/A	N/A	3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	Administrative Variation – Section 2.2.1.5
3.5.2.1	Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ [12 ft 2 inches].	3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	Administrative Variation - Section 2.2.1.6
3.5.2.2	Verify, for each required core spray (CS) subsystem, the: a. Suppression pool water level is ≥ [12 ft 2 inches] or b. Condensate storage tank water level is ≥ [12 ft].	3.5.2.2	Verify, for the required ECCS injection/spray subsystem, the suppression pool water level is ≥ -6.25 inches with or -7.25 inches without differential pressure control.	Administrative Variation - Section 2.2.1.6
3.5.2.3	Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	3.5.2.3	Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	Administrative Variation - Section 2.2.1.1
3.5.2.4	Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	3.5.2.4	Verify the required ECCS injection/spray subsystem, each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	Administrative Variation - Section 2.2.1.1
3.5.2.5	Verify each required ECCS pump develops the specified flow rate [against a system head corresponding to the specified reactor pressure].	N/A	N/A	Administrative Variation - Section 2.2.1.2
N/A	N/A	3.5.2.5	Operate the required ECCS injection/spray subsystem through the test return line for ≥ 10 minutes.	Administrative Vatiation – Section 2.2.1.5

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
N/A	N/A	3.5.2.6	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	Administrative Vatiation – Section 2.2.1.5
3.5.2.6	Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	N/A	N/A	Administrative Variation - Section 2.2.1.2
N/A	N/A	3.5.2.7	Verify the required ECCS injection/spray subsystem can be manually operated.	Administrative Vatiation – Section 2.2.1.5
3.5.3	**RCIC System**	**3.5.3**	**RCIC System**	
3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	No variation
3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	No variation
3.5.3.3	Verify, with [reactor pressure] ≤ [I020] psig and ≥ [920] psig, the RCIC pump can develop a flow rate ≥ [400] gpm [against a system head corresponding to reactor pressure].	3.5.3.3	Verify, with reactor pressure ≤ 1040 psig and ≥ 950 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	No variation
3.5.3.4	Verify, with [reactor pressure] ≤ [165] psig, the RCIC pump can develop a flow rate ≥ [400] gpm [against a system head corresponding to reactor pressure].	3.5.3.4	Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	No variation
3.5.3.5	Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	3.5.3.5	Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	No variation
3.6.1.1	**Primary Containment**	**3.6.1.1**	**Primary Containment**	
3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > [0.25] inch water gauge per minute tested over a [10] minute period at an initial differential pressure of [1] psid.	3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.25 inch water gauge per minute tested over a 10 minute period at an initial differential pressure of 1 psid.	Administrative Variation – Section 2.2.1.1 (STS has additional non-SFCP Frequency element not in BFN SR)
3.6.1.2	**Primary Containment Air Lock**	**3.6.3**	**Containment Isolation Valves**	
3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at time.	3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at time.	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.6.1.3	**Primary Containment Isolation Valves (PCIVs)**	**3.6.1.3**	**PCIVs**	
3.6.1.3.1	Verify each [18] inch primary containment purge valve is sealed closed except for one purge valve in a penetration flow path while in Condition E of this LCO.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.3.2	Verify each [18] inch primary containment purge valve is closed.	3.6.1.3.1	Verify each 18 and 20 inch primary containment purge valve is closed.	Administrative Variation - Section 2.2.1.1
3.6.1.3.3	Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	3.6.1.3.2	Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Administrative Variation - Section 2.2.1.1
3.6.1.3.5	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	Administrative Variation - Section 2.2.1.1
3.6.1.3.6	Verify the isolation time of each power operated automatic PCIV, [except for MSIVs], is within limits.	3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	Administrative Variation - Section 2.2.1.4
3.6.1.3.7	Perform leakage rate testing for each primary containment purge valve with resilient seals.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.3.8	Verify the isolation time of each MSIV is ≥ [2] seconds and:≤; [8] seconds.	3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	Administrative Variation - Section 2.2.1.4
3.6.1.3.9	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	Administrative Variation - Section 2.2.1.1
3.6.1.3.10	Verify each [a representative sample of] reactor instrumentation line EFCV actuates [on a simulated instrument line break to restrict flow to ≤ 1 gph].	3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	Administrative Variation - Section 2.2.1.1
3.6.1.3.11	Remove and test the explosive squib from each shear isolation valve of the TIP System.	3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	Administrative Variation - Section 2.2.1.1
3.6.1.3.15	Verify each [ ] inch primary containment purge valve is blocked to restrict the valve from opening > [50]%.	N/A	N/A	Administrative Variation - Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.6.1.4	**Drywell Pressure**	**N/A**	**N/A**	
3.6.1.4.1	Verify drywell pressure is within limit.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.5	**Drywell Air Temperature**	**3.6.1.4**	**Drywell Air Temperature**	
3.6.1.5.1	Verify drywell average air temperature is within limit.	3.6.1.4.1	Verify drywell average air temperature is within limit.	Administrative Variation - Section 2.2.1.1
3.6.1.6	**Low-Low Set (LLS) Valves**	**N/A**	**N/A**	
3.6.1.6.1	Verify each LLS valve opens when manually months [on a actuated.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.6.2	Verify the LLS System actuates on an actual or simulated automatic initiation signal.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.7	**Reactor Building-to-Suppression Chamber Vacuum Breakers**	**3.6.1.5**	**Reactor Building-to-Suppression Chamber Vacuum Breakers**	
3.6.1.7.1	Verify each vacuum breaker is closed.	3.6.1.5.1	Verify each vacuum breaker is closed.	Administrative Variation – Section 2.2.1.1
3.6.1.7.2	Perform a functional test of each vacuum breaker.	3.6.1.5.2	Perform a functional test of each vacuum breaker.	Administrative Variation – Section 2.2.1.1
3.6.1.7.3	Verify the opening setpoint of each vacuum breaker is ≤ [0.5] psid.	3.6.1.5.3	Verify the opening setpoint of each vacuum breaker is ≤ 0.5 psid.	Administrative Variation – Section 2.2.1.1
3.6.1.8	**Suppression Chamber-to-Drywell Vacuum Breakers**	**3.6.1.6**	**Suppression Chamber-to-Drywell Vacuum Breakers**	
3.6.1.8.1	Verify each vacuum breaker is closed.	3.6.1.6.1	Verify each vacuum breaker is closed.	Administrative Variation – Section 2.2.1.1
3.6.1.8.2	Perform a functional test of each required vacuum breaker	3.6.1.6.2	Perform a functional test of each required vacuum breaker	Administrative Variation – Section 2.2.1.4
3.6.1.8.3	Verify the opening setpoint of each required vacuum breaker is ≤ [0.5] psid	3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	Administrative Variation – Section 2.2.1.1
3.6.1.9	**Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)**	**N/A**	**N/A**	
3.6.1.9.1	Operate each MSIV LCS blower ≥ [15] minutes.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.9.2	Verify electrical continuity of each inboard MSIV LCS subsystem heater element circuitry.	N/A	N/A	Administrative Variation - Section 2.2.1.2
3.6.1.9.3	Perform a system functional test of each MSIV LCS subsystem.	N/A	N/A	Administrative Variation – Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.6.2.1	**Suppression Pool Average Temperature**	**3.6.2.1**	**Suppression Pool Average Temperature**	
3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	No variation
3.6.2.2	**Suppression Pool Water Level**	**3.6.2.2**	**Suppression Pool Water Level**	
3.6.2.2.1	Verify suppression pool water level is within limits.	3.6.2.2.1	Verify suppression pool water level is within limits.	No variation
3.6.2.3	**RHR Suppression Pool Cooling**	**3.6.2.3**	**RHR Suppression Pool Cooling**	
3.6.2.3.1	Verify each RHR suppression pool cooling days subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	No variation
3.6.2.3.2	Verify each RHR pump develops a flow rate > [7700] gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	Administrative Variation – Section 2.2.1.4
3.6.2.4	**RHR Suppression Pool Spray**	**3.6.2.4**	**RHR Suppression Pool Spray**	
3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position	3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	No variation
3.6.2.4.2	[Verify each RHR pump develops a flow rate ≥ [400] gpm through the heat exchanger while operating in the suppression pool spray mode.	N/A	N/A	Administrative Variation – Section 2.2.1.2
N/A	N/A	3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	Administrative Variation – Section 2.2.1.5
N/A	**N/A**	**3.6.2.5**	**RHR Drywell Spray**	
N/A	N/A	3.6.2.5.1	Verify each RHR drywell spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	Administrative Variation – Section 2.2.1.5

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
N/A	N/A	3.6.2.5.2	Verify each drywell spray nozzle is unobstructed.	Administrative Variation – Section 2.2.1.5
3.6.2.5	**Drywell-to-Suppression Chamber Differential Pressure**	**3.6.2.6**	**Drywell-to-Suppression Chamber Differential Pressure**	
3.6.2.5.1	Verify drywell-to-suppression chamber differential pressure is within limit.	3.6.2.6.1	Verify drywell-to-suppression chamber differential pressure is within limit.	Administrative Variation – Section 2.2.1.1
3.6.3.1	**[Drywell Cooling System Fans]**	**N/A**	**N/A**	
3.6.3.1.1	Operate each [required] [drywell cooling system fan] for ≥ [15] minutes.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.6.3.1.2	[Verify each [required] [drywell cooling system fan] flow rate is ≥ [500] scfm.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.6.3.2	**Primary Containment Oxygen Concentration**	**3.6.3.2**	**Primary Containment Oxygen Concentration**	
3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	3.6.3.2.1	Verify primary containment oxygen concentration is within limits.	No variation
3.6.3.3	**Containment Atmospheric Dilution (CAD) System**	**3.6.3.1**	**Containment Atmospheric Dilution (CAD) System**	
3.6.3.3.1	Verify ≥ [4350] gal of liquid nitrogen are contained in the CAD System.	3.6.3.1.1	Verify ≥ 2615 gal of liquid nitrogen are contained in each nitrogen storage tank.	Administrative Variation – Section 2.2.1.1
3.6.3.3.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	3.6.3.1.2	Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	Administrative Variation – Section 2.2.1.1
3.6.4.1	**[Secondary] Containment**	**3.6.4.1**	**Secondary Containment**	
3.6.4.1.1	[Verify [secondary] containment vacuum is ≥ [0.25] inch of vacuum water gauge.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.6.4.1.2	Verify all [secondary] containment equipment hatches are closed and sealed.	3.6.4.1.1	Verify all secondary containment equipment hatches are closed and sealed.	Administrative Variation – Section 2.2.1.1
3.6.4.1.3	Verify one [secondary] containment access door in each access opening is closed.	3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	Administrative Variation – Section 2.2.1.1
3.6.4.1.4	[Verify [secondary] containment can be drawn down to ≥ [0.25] inch of vacuum water gauge in ≤ [120] seconds using one standby gas treatment (SGT) subsystem.	3.6.4.1.3	Verify two standby gas treatment (SGT) subsystems will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 120 seconds.	Administrative Variation – Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.6.4.1.5	Verify the [secondary] containment can be maintained ≥ [0.25] inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate ≤ [4 000] cfm.	3.6.4.1.4	Verify two SGT subsystems can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment at a flow rate ≤ 12,000 cfm.	Administrative Variation – Section 2.2.1.1
3.6.4.2	**Secondary Containment Isolation Valves (SCIVs)**	**3.6.4.2**	**Secondary Containment Isolation Valves (SCIVs)**	
3.6.4.2.1	Verify each secondary containment isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.6.4.2.2	Verify the isolation time of each power operated, automatic SCIV is within limits.	3.6.4.2.1	Verify the isolation time of each power operated, automatic SCIV is within limits.	Administrative Variation – Section 2.2.1.1
3.6.4.2.3	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	3.6.4.2.2	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	Administrative Variation – Section 2.2.1.1
3.6.4.3	**Standby Gas Treatment (SGT) System**	**3.6.4.3**	**Standby Gas Treatment (SGT) System**	
3.6.4.3.1	Operate each SGT subsystem for ≥ [10] continuous hours [with heaters operating].	3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	Administrative Variation – Section 2.2.1.1
3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	No variation
3.6.4.3.4	[Verify each SGT filter cooler bypass damper can be opened and the fan started.	N/A	N/A	Administrative Variation – Section 2.2.1.2
N/A	N/A	3.6.4.3.4	Verify the SGT decay heat discharge dampers are in the correct position.	Administrative Variation – Section 2.2.1.5
3.7.1	**Residual Heat Removal Service Water (RHRSW) System**	**3.7.1**	**Residual Heat Removal Service Water (RHRSW) System**	
3.7.1.1	Verify each RHRSW manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	3.7.1.1	Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	Administrative Variation – Section 2.2.1.1
3.7.2	**[Plant Service Water (PSW)] System and [Ultimate Heat Sink (UHS)]**	**3.7.2**	**Emergency Equipment Cooling Water (EECW) System and Ultimate Heat Sink (UHS)**	
3.7.2.1	[Verify the water level of each [PSW] cooling tower basin is ≥ [ ] ft.	N/A	N/A	Administrative Variation – Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.7.2.2	[Verify the water level [in each PSW pump well of the intake structure] is ≥ [60.1] ft [mean sea level].	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.7.2.3	[Verify the average water temperature of [UHS] is ≤ [ ]°F.	3.7.2.1	Verify the average water temperature of UHS is ≤ 95°F.	Administrative Variation – Section 2.2.1.1
3.7.2.4	[Operate each [PSW] cooling tower fan for ≥ [15] minutes.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.7.2.5	Verify each [PSW] subsystem manual, power operated, and automatic valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	3.7.2.2	Verify each EECW system manual and power operated valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	Administrative Variation – Section 2.2.1.1
3.7.2.6	Verify each [PSW] subsystem actuates on an actual or simulated initiation signal	3.7.2.3	Verify each required EECW pump actuates on an actual or simulated initiation signal.	Administrative Variation – Section 2.2.1.1
3.7.3	**Diesel Generator (DG) [1B] Standby Service Water (SSW) System**	**N/A**	**N/A**	
3.7.3.1	Verify each DG [1B] SSW System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.7.3.2	Verify the DG [1B] SSW System pump starts automatically when DG [1B] starts and energizes the respective bus.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.7.4	**[Main Control Room Environmental Control (MCREC)] System**	**3.7.3**	**Control Room Emergency Ventilation (CREV) System**	
3.7.4.1	Operate each [MCREC] subsystem for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].	3.7.3.1	Operate each CREV subsystem for ≥ 15 continuous minutes with the heaters operating.	Administrative Variation – Section 2.2.1.1
3.7.4.3	Verify each [MCREC] subsystem actuates on an actual or simulated initiation signal.	3.7.3.3	Verify each CREV subsystem actuates on an actual or simulated initiation signal.	Administrative Variation – Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.7.4.4	[Verify each [MCREC] subsystem can maintain a positive pressure of ≥ [0.1] inches water gauge relative to the [turbine building] during the [pressurization] mode of operation at a flow rate of ≤ [400] cfm.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.7.5	**[Control Room Air Conditioning (AC)] System**	**3.7.4**	**Control Room AC System**	
3.7.5.1	Verify each [control room AC] subsystem has the capability to remove the assumed heat load.	3.7.4.1	Verify each control room AC subsystem has the capability to remove the assumed heat load.	Administrative Variation – Section 2.2.1.1
3.7.6	**Main Condenser Offgas**	**N/A**	**N/A**	
3.7.6.1	Verify the gross gamma activity rate of the noble gases is ≤ [240] mCi/second [after decay of 30 minutes].	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.7.7	**Main Turbine Bypass System**	**3.7.5**	**Main Turbine Bypass System**	
3.7.7.1	Verify one complete cycle of each main turbine bypass valve.	3.7.5.1	Verify one complete cycle of each main turbine bypass valve.	Administrative Variation – Section 2.2.1.1
3.7.7.2	Perform a system functional test.	3.7.5.2	Perform a system functional test.	Administrative Variation – Section 2.2.1.1
3.7.7.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	3.7.5.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	Administrative Variation – Section 2.2.1.1
3.7.8	**Spent Fuel Storage Pool Water Level**	**3.7.6**	**Spent Fuel Storage Pool Water Level**	
3.7.8.1	Verify the spent fuel storage pool water level is ≥ [23] ft above the top of the irradiated fuel assemblies seated in the spent fuel storage pool racks.	3.7.6.1	Verify the spent fuel storage pool water level is ≥ 21.5 ft above the top of the irradiated fuel assemblies seated in the spent fuel storage pool racks.	Administrative Variation – Section 2.2.1.1
3.8.1	**AC Sources - Operating**	**3.8.1**	**AC Sources - Operating**	
3.8.1.1	Verify correct breaker alignment and indicated power availability for each [required] offsite circuit.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.2	Verify each DG starts from standby conditions and achieves steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz.	3.8.1.1	Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3940 V and ≤ 4400 V and frequency of ≥ 58.8 Hz and ≤ 61.2 Hz.	Administrative Variation – Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.8.1.3	Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ [1710] kW and ≤ [2000] kW.	3.8.1.2	Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2295 kW and ≤ 2550 kW.	Administrative Variation – Section 2.2.1.1
3.8.1.4	Verify each day tank [and engine mounted tank] contains ≥ [900] gal of fuel oil.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.5	Check for and remove accumulated water from each day tank [and engine mounted tank].	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.6	Verify the fuel oil transfer system operates to [automatically] transfer fuel oil from storage tank[s] to the day tank [and engine mounted tank].	3.8.1.3	Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7-day storage tank to the day tank.	Administrative Variation – Section 2.2.1.1
3.8.1.7	Verify each DG starts from standby condition and achieves: a. In ≤ [12] seconds, voltage ≥ [3740] V and frequency ≥ 58.8] Hz and b. Steady state voltage ≥ [3740] V and ≤ [4580] V, and frequency ≥ [58.8] Hz and ≤ [61.2] Hz.	3.8.1.4	Verify each DG starts from standby condition and achieves in ≤ 10 seconds, voltage ≥ 3940 V, and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 3940 V and ≤ 4400 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	Administrative Variation – Section 2.2.1.1
3.8.1.8	Verify [automatic [and] manual] transfer of [unit power supply] from the [normal offsite circuit to the alternate] offsite circuit.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.9	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ [65.5] Hz, b. Within [3] seconds following load rejection, the voltage is ≥ [3740] V and ≤ [4580] V, and c. Within [6] seconds following load rejection, the frequency is ≥ [58.8] Hz and ≤ [61.2] Hz.	3.8.1.5	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; b. Following load rejection, the stead state voltage recovers to ≥ 3940 V and ≤ 4400 V. c. Following load rejection, the steady state frequency recovers to ≥ 58.8 Hz and ≤ 61.2 Hz.	Administrative Variation – Section 2.2.1.1
3.8.1.10	Verify each DG does not trip and voltage is maintained ≤ [4800] V during and following a load rejection of ≥ [1710] kW and ≤ [2000] kW.	N/A	N/A	Administrative Variation – Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
N/A	N/A	3.8.1.6	Verify on an actual or simulated accident signal each DG auto-starts from standby condition.	Administrative Variation – Section 2.2.1.5
3.8.1.11	Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, and c. DG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ [12] seconds, 2. Energizes auto-connected shutdown loads through [automatic load sequencer], 3. Maintains steady state voltage ≥ [3740] V and ≤ [4580] V, 4. Maintains steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and 5. Supplies permanently connected and auto-connected shutdown loads for ≥ [5] minutes.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.12	Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and: a. In ≤ [12] seconds after auto-start and during tests, achieves voltage ≥ [3740] V and frequency ≥ [58.8] Hz, b. Achieves steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz, c. Operates for ≥ 5 minutes, d. Permanently connected loads remain energized from the offsite power system, and e. Emergency loads are energized [or auto-connected through the automatic load sequencer] from the offsite power system.	N/A	N/A	Administrative Variation – Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.8.1.13	Verify each DG's automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ECCS initiation signal] except: a. Engine overspeed, b. Generator differential current, [c. Low lube oil pressure, d. High crankcase pressure, and e. Start failure relay.]	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.14	Verify each DG operates for ≥ 24 hours: a. For ≥ [2] hours loaded ≥ [3100] kW and ≤ [3400] kW and b. For the remaining hours of the test loaded ≥ [2850] kW and ≤ [3150] kW.	3.8.1.7	Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2680 kW and ≤ 2805 kW; and b. For the remaining hours of the test loaded ≥ 2295 kW and ≤ 2550 kW.	Administrative Variation – Section 2.2.1.1
3.8.1.15	Verify each DG starts and achieves: a. In ≤ [12] seconds, voltage ≥ [3740] V and frequency ≥ [58.8] Hz and b. Steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.16	Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power, b. Transfers loads to offsite power source, and c. Returns to ready-to-load operation.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.1.17	Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by: a. Returning DG to ready-to-load operation and [b. Automatically energizing the emergency load from offsite power].	N/A	N/A	Administrative Variation – Section 2.2.1.2

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.8.1.18	[Verify interval between each sequenced load block is within ± [10% of design interval] for each load sequencer timer].	3.8.1.8	Verify interval between each timed load block is within the allowable values for each individual timer.	Administrative Variation – Section 2.2.1.1
3.8.1.19	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, and c. DG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ [12] seconds, 2. Energizes auto-connected emergency loads through [load sequencer], 3. Achieves steady state voltage ≥ [3740] V and ≤ [4580] V, 4. Achieves steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and 5. Supplies permanently connected and auto-connected emergency loads for ≥ [5] minutes.	3.8.1.9	Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual timers, 3. achieves steady state voltage: ≥ 3940 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	Administrative Variation – Section 2.2.1.1
3.8.1.20	Verify when started simultaneously from standby condition, [each] [2A and 2C] DG achieves: a. In ≤ [12] seconds, voltage ≥[3740] V and frequency ≥ [58.8] Hz and b. Steady state voltage ≥ [374] V and ≤[4580] V, and frequency ≥[58.8] Hz and ≤[61.2] Hz.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.3	**Diesel Fuel Oil, Lube Oil, and Starting Air**	**3.8.3**	**Diesel Fuel Oil, Lube Oil, and Starting Air**	
3.8.3.1	Verify each fuel oil storage tank contains ≥ [33,000] gal of fuel.	3.8.3.1	Verify each fuel oil storage tank contains ≥ a 7-day supply.	Administrative Variation – Section 2.2.1.1
3.8.3.2	Verify lube oil inventory is ≥ [500] gal.	3.8.3.2	Verify lube oil inventory is ≥ a 7-day supply.	Administrative Variation – Section 2.2.1.1
3.8.3.4	Verify each DG air start receiver pressure is ≥ [225] psig.	3.8.3.4	Verify each required DG air start receiver pressure is ≥ 165 psig.	Administrative Variation – Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	No variation
3.8.4	**DC Sources - Operating**	**3.8.4**	**DC Sources - Operating**	
3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	3.8.4.1	Verify vital battery terminal voltage is ≥ 248 V for each Unit and Shutdown Board battery and ≥ 124 V for each DG battery on float charge.	Administrative Variation – Section 2.2.1.1
3.8.4.2	Verify each required battery charger supplies ≥ [400 amps for station service subsystems, and ≥ 100 amps for DG subsystems] at greater than or equal to the minimum established float voltage for ≥ [4] hours. OR Verify each battery charger can recharge the battery to the fully charged state within [24] hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	N/A	N/A	Administrative Variation – Section 2.2.1.2
N/A	N/A	3.8.4.2	Verify each required battery charger charges its respective battery after the battery's ~~24 month~~ service test.	Administrative Variation – Section 2.2.1.9
3.8.4.3	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	3.8.4.3	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	The Note is revised to delete reference to the 60-month periodicity. Technical Variation – Section 2.2.2.5
N/A	N/A	3.8.4.5	Verify each required battery charger supplies ≥ 300 amps for the Unit and 50 amps for the Shutdown Board subsystems at. ≥ 210 V and ≥ 15 amps for DG subsystems at ≥ 105 V.	Administrative Variation – Section 2.2.1.5
3.8.6	**Battery Parameters**	**3.8.6**	**Battery Parameters**	
3.8.6.1	Verify each battery float current is ≤ [2] amps.	N/A	N/A	Administrative Variation – Section 2.2.1.2
N/A	N/A	3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	Administrative Variation – Section 2.2.1.5

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.8.6.2	Verify each battery pilot cell float voltage is ≥ [2.07] V.	N/A	N/A	Administrative Variation – Section 2.2.1.2
N/A	N/A	3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	Administrative Variation – Section 2.2.1.5
3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F for Unit and Shutdown Board battery (except Shutdown Board battery 3EB) and ≥ 40°F for Shutdown Board battery 3EB and each DG batteries.	Administrative Variation – Section 2.2.1.1
3.8.6.5	Verify each battery connected cell voltage is ≥ [2.07] V.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.6.6	Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	3.8.4.4	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	Administrative Variation – Section 2.2.1.1
3.8.7	**Inverters - Operating**	**N/A**	**N/A**	
3.8.7.1	Verify correct inverter voltage, [frequency,] and alignment to required AC vital buses.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.8	**Inverters - Shutdown**	**N/A**	**N/A**	
3.8.8.1	Verify correct inverter voltage, [frequency,] and alignments to [required] AC vital buses.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.8.9	**Distribution System - Operating**	**3.8.7**	**Distribution Systems - Operating**	
3.8.9.1	Verify correct breaker alignments and voltage to [required] AC, DC, and AC vital bus electrical power distribution subsystems.	3.8.7.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	Administrative Variation – Section 2.2.1.1
3.8.10	**Distribution System - Shutdown**	**3.8.8**	**Distribution System - Shutdown**	
3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, [and AC vital bus] electrical power distribution subsystems.	3.8.8.1	Verify indicated power availability to required AC and DC electrical power distribution subsystems.	Administrative Variation – Section 2.2.1.1
3.9.1	**Refueling Equipment Interlocks**	**3.9.1**	**Refueling Equipment Interlocks**	
3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs:	3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs:	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
	a. All-rods-in, b. Refuel platform position, c. Refuel platform [fuel grapple], fuel loaded, [d. Refuel platform fuel grapple fully retracted position.] [e. Refuel platform frame mounted hoist, fuel loaded.] [f. Refuel platform monorail mounted hoist, fuel loaded,] and [g. Service platform hoist, fuel loaded.]		a. All-rods-in, b. Refuel platform position, c. Refuel platform main hoist, fuel loaded, d. Refuel platform fuel grapple fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, f. Refuel platform monorail mounted hoist, fuel loaded, and g. Service platform hoist, fuel loaded.	
3.9.2	**Refuel Position One-Rod-Out Interlock**	**3.9.2**	**Refuel Position One-Rod-Out Interlock**	
3.9.2.1	Verify reactor mode switch locked in Refuel position	3.9.2.1	Verify reactor mode switch locked in refuel position.	No variation
3.9.2.2	Perform CHANNEL FUNCTIONAL TEST.	3.9.2.2	Perform CHANNEL FUNCTIONAL TEST.	No variation
3.9.3	**Control Rod Position**	**3.9.3**	**Control Rod Position**	
3.9.3.1	Verify all control rods are fully inserted.	3.9.3.1	Verify all control rods are fully inserted.	No variation
3.9.5	**Residual Heat Removal (RHR) and Coolant Circulation - High Water Level**	**3.9.5**	**Residual Heat Removal (RHR) and Coolant Circulation - High Water Level**	
3.9.5.1	Insert each withdrawn control rod at least one notch.	3.9.5.1	Insert each withdrawn control rod at least one notch.	No variation
3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ [940] psig.	3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	No variation
3.9.6	**[RPV] Water Level –[Irradiated Fuel]**	**3.9.6**	**RPV Water Level**	
3.9.6.1	Verify [RPV] water level is ≥ [23] ft above the top of the [RPV flange].	3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	No variation
3.9.7	**[RPV] Water Level – [New Fuel or Control Rods]**	**N/A**	**N/A**	
3.9.7.1	Verify [RPV] water level is ≥ [23] ft above the top of irradiated fuel assemblies seated within the [RPV].	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.9.8	**RHR – High Water Level**	**3.9.7**	**RHR–High Water Level**	
3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	Administrative Variation – Section 2.2.1.1
3.9.9	**RHR – Low Water Level**	**3.9.8**	**RHR–Low Water Level**	
3.9.9.1	Verify one RHR shutdown cooling subsystem is operating.	3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	Administrative Variation – Section 2.2.1.1

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.10.2	**Reactor Mode Switch Interlock Testing**	**3.10.2**	**Reactor Mode Switch Interlock Testing**	
3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	No variation
3.10.2.2	Verify no CORE ALTERATIONS are in progress.	3.10.2.2	Verify no CORE ALTERATIONS are in progress.	No variation
3.10.3	**Single Control Rod Withdrawal – Hot Shutdown**	**3.10.3**	**Single Control Rod Withdrawal – Hot Shutdown**	
3.10.3.2	Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	3.10.3.2	Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	No variation
3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	No variation
3.10.4	**Single Control Rod Withdrawal – Cold Shutdown**	**3.10.4**	**Single Control Rod Withdrawal – Cold Shutdown**	
3.10.4.2	Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	3.10.4.2	Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	No variation
3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	No variation
3.10.4.4	Verify a control rod withdrawal block is inserted.	3.10.4.4	Verify a control rod withdrawal block is inserted.	No variation
3.10.5	**Single CRD Removal – Refueling**	**3.10.5**	**Single CRD Removal – Refueling**	
3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	No variation
3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	No variation
3.10.5.3	Verify a control rod withdrawal block is inserted.	3.10.5.3	Verify a control rod withdrawal block is inserted.	No variation

TSTF-425 Section/ SR No.	NUREG-1433 Technical Specification Section Title/Surveillance Description	BFN Section/ SR No.	BFN Technical Specification Section Title/Surveillance Description	Disposition and Attachment 1 Reference
3.10.5.5	Verify no CORE ALTERATIONS are in progress.	3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	Administrative Variation – Section 2.2.1.1
3.10.6	**Multiple Control Rod Withdrawal - Refueling**	**3.10.6**	**Multiple Control Rod Withdrawal - Refueling**	
3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed.	No variation
3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	No variation
3.10.6.3	Verify fuel assemblies being loaded are in compliance with an approved [spiral] reload sequence.	3.10.6.3	Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence.	No variation
3.10.8	**Shutdown Margin (SDM) Test - Refueling**	**3.10.8**	**SDM Test - Refueling**	
3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	3.10.8.4	Verify no other CORE ALTERATIONS are in progress.	No variation
3.10.8.6	Verify CRD charging water header pressure ≥ [940] psig.	3.10.8.6	Verify CRD charging water header pressure ≥ 940 psig.	No variation
3.10.9	**Recirculation Loops - Testing**	**N/A**	**N/A**	
3.10.9.1	Verify LC0 3.4.1 requirements suspended for ≤ 24 hours.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.10.9.2	Verify THERMAL POWER is ≤ [5]% RTP during PHYSICS TESTS.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.10.10	**Training Startups**	**N/A**	**N/A**	
3.10.10.1	Verify all OPERABLE IRM channels are ≤ [25/40] divisions of full scale on Range 7.	N/A	N/A	Administrative Variation – Section 2.2.1.2
3.10.10.2	Verify average reactor coolant temperature is < 200°F.	N/A	N/A	Administrative Variation – Section 2.2.1.2
5.5.	**Programs and Manuals**	**5.5.**	**Programs and Manuals**	
5.5.15	Surveillance Frequency Control Program	5.5.15	Surveillance Frequency Control Program	No variation