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CP-201101038
TXX-11093

Ref: 10 CFR 50.90

August 1, 2011

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT (CPNPP) DOCKET NOS. 50-445 AND 50-446, LICENSE AMENDMENT REQUEST (LAR) 11-001, APPLICATION FOR TECHNICAL SPECIFICATION CHANGE REGARDING RISK-INFORMED JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM

REFERENCE: Technical Specification Task Force (TSTF) Traveler 425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b" (Accession No. ML090850642)

Dear Sir or Madam:

Pursuant to 10CFR50.90, Luminant Generation Company LLC (Luminant Power) hereby requests an amendment to the CPNPP Unit 1 Operating License (NPF-87) and CPNPP Unit 2 Operating License (NPF-89) by incorporating the attached change into the CPNPP Unit 1 and 2 Technical Specifications (TS). This change request applies to both Units. The proposed amendment would modify the CPNPP Unit 1 and 2 Technical Specifications by relocating specific surveillance frequencies to a licensee controlled program with the implementation of Nuclear Energy Institute (NEI) 04–10 "Risk-Informed Technical Specification Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies."

CPNPP is a member of the Strategic Teaming and Resource Sharing (STARS) alliance. This amendment request has been prepared in conjunction with STARS and utilized the lessons learned from previous STARS amendments requests. The STARS alliance has previously obtained approval for two member utilities to utilize the provisions of NEI 04-10. Additional STARS utilities are considering similar risk informed application requests. The STARS alliance plans on using the experience and resources of the alliance in order to share programs, training, and procedures relative to a licensee controlled surveillance frequency control program.

All required information is provided in the attachments to this letter. Attachment 1 provides a description of the proposed changes, the required confirmation of applicability, and plant-specific verifications. Attachment 2 provides documentation of PRA technical adequacy. Attachment 3 provides the existing TS pages marked up to show the proposed change. Attachment 4 provides the marked up existing TS Bases in support of the proposed change. Attachment 5 provides revised (retyped) TS pages. Attachment 6 provides the revised (retyped) TS Bases pages. Attachment 7 provides the No Significant Hazards Consideration. Attachment 8 provides a cross-reference between Technical Specification Task Force (TSTF)-425 (NUREG-1431) and the CPNPP Unit 1 and Unit 2 Technical Specifications.

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Luminant Power requests approval of the proposed License Amendment by July 31, 2012, to be implemented within 180 days of the issuance of the license amendment. The approval date was administratively selected to allow for NRC review but the plant does not require this amendment to allow continued safe full power operations.

In accordance with 10CFR50.91(b), Luminant Power is providing the State of Texas with a copy of this proposed amendment.

This communication contains no new or revised commitments.

Should you have any questions, please contact Mr. Robert A. Slough at (254) 897-5727.

I state under penalty of perjury that the foregoing is true and correct.

Executed on August 1, 2011.

Sincerely,

Luminant Generation Company, LLC

Rafael Flores

By: Fred W. Madden

Fred W. Madden
Director, Oversight and Regulatory Affairs

Attachments
1. Description and Assessment
2. Documentation of PRA Technical Adequacy
3. Proposed Technical Specifications Changes (Markup)
4. Proposed Technical Specifications Bases Changes (Markup for Information Only)
5. Retyped Technical Specification Pages
6. Retyped Technical Specification Bases Pages (For Information Only)
7. Proposed No Significant Hazards Consideration
8. TSTF-425 (NUREG-1431) vs. CPNPP TS Cross Reference

c -
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ATTACHMENT 1 to TXX-11093

DESCRIPTION AND ASSESSMENT

LICENSEE'S EVALUATION

1.0 DESCRIPTION

By this letter, Luminant Generation Company LLC (Luminant Power) requests an amendment to the Comanche Peak Nuclear Power Plant (CPNPP) Unit 1 Operating License (NPF-87) and the CPNPP Unit 2 Operating License (NPF-89) by incorporating the attached change into the CPNPP Unit 1 and 2 Technical Specifications (TS). Proposed change LAR 11-001 is a request to revise the TS for CPNPP Units 1 and 2.

No changes to the CPNPP Final Safety Analysis Report (FSAR) are anticipated at this time as a result of this License Amendment Request (LAR).

2.0 PROPOSED CHANGE

The proposed amendment would modify the CPNPP Technical Specifications by relocating specific surveillance frequencies to a licensee-controlled program with the adoption of Technical Specification Task Force (TSTF) Traveler 425-A, 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, to Technical Specification (TS) Section 5, Administrative Controls. The existing TS Bases information describing the basis for the Surveillance Frequency will be relocated to the licensee-controlled Surveillance Frequency Control Program.

3.0 BACKGROUND

The changes are consistent with NRC approved Industry/TSTF Standard Technical Specifications (STS) change TSTF-425-A, Revision 3, (ADAMS Accession No. ML090850642). The Federal Register Notice published on July 6, 2009 (74 FR 31996) announced the availability of this TS improvement. Included in the Federal Register Notice was a generic Safety Evaluation intended to be used for processing/approving license amendment requests submitted by licensees choosing to adopt TSTF-425-A.

4.0 TECHNICAL ANALYSIS

4.1 Applicability of Published Safety Evaluation

Luminant Power has reviewed the generic safety evaluation included in the Federal Register Notice published on July 6, 2009 (74 FR 31996) for implementation of TSTF-425-A, Revision 3, and the requirements specified in NEI 04-10, "Risk-Informed Technical Specification Initiative 5B, Risk-Informed Method for Control of Surveillance Frequencies," Rev. 1, (ADAMS Accession No. ML071360456). Attachment 2 includes Luminant Power's documentation of the technical adequacy of the current CPNPP probabilistic risk assessment (PRA) with regards to the requirements of Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2 (ADAMS Accession No. ML090410014) 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. Luminant Power has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to CPNPP and justify the requested license amendment to incorporate the changes to the CPNPP TS.

4.2 Optional Changes and Variations

The proposed amendment is consistent with the NUREG-1431 Standard Technical Specifications (STS) changes described in TSTF-425-A, Revision 3; but, Luminant proposes variations or deviations from TSTF-425-A, as identified below. The proposed variations or deviations may include differing TS surveillance numbers.

- The definition of STAGGERED TEST BASIS is being retained in CPNPP TS Definition Section 1.1 since this terminology is mentioned in Administrative TS Section 5.5.17, "Control Room Envelope Habitability Program," which is not the subject of this amendment request and is not proposed to be changed. This is an administrative deviation from TSTF-425-A with no impact on the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996).

- NRC letter dated April 14, 2010 (Reference 1) provides a change to an optional insert (INSERT #2) to the existing TS Bases to facilitate adoption of the TSTF while retaining the existing NUREG-1431 TS surveillance frequency (SF) Bases considerations for licensees not choosing to adopt TSTF-425-A. The TSTF-425-A TS Bases insert states as follows:

  "The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program."

Recently several licensees submitting license amendment requests for adoption of TSTF-425-A have identified a need to deviate from this statement because it only applies to frequencies that have been changed in accordance with the Surveillance Frequency Control Program (SFCP) and does not apply to frequencies that are relocated but not changed.

The NRC staff agreed that the TSTF-425-A TS Bases insert applies to SFs that are relocated and subsequently evaluated and changed, in accordance with the SFCP in NRC letter dated April 14, 2010 (Reference 1). The TSTF-425-A TS Bases does not apply to SFs relocated to the SFCP but not changed. Therefore, for SFs relocated to the SFCP but not changed, the existing TS Bases description remains a valid description of the TS SF Bases for the unchanged SF.

To resolve this issue with existing license amendment requests and to avoid future problems, the NRC staff supported the following recommended changes to clarify the applicability of the TS SF Bases, maintain consistency with TSTF-425-A TS SFCP requirements, and allow retention of existing TS SF Bases for licensees who choose not to adopt TSTF-425-A:

1. The existing Bases information describing the basis for the Surveillance Frequency will be relocated to the licensee-controlled Surveillance Frequency Control Program.

2. The TSTF-425-A TS Bases, INSERT #2, should be added to the end of the existing TS Bases and changed to read as follows: The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Luminant Power has incorporated these recommended changes into this license amendment request.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Luminant Power has reviewed the proposed no significant hazards consideration determination (NSHC) published in the Federal Register on July 6, 2009 (74 FR 31996) and has concluded that the proposed NSHC presented in the Federal Register notice is applicable to Comanche Peak. Therfore, the NSHC determination for this amendment request is provided as Attachment 7 to this license amendment request which satisfies the requirements of 10 CFR 50.91(a).

5.2 Applicable Regulatory Requirements/Criteria

None

In 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.

6.0 ENVIRONMENTAL CONSIDERATION

Luminant Power has determined that the proposed amendment would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 PRECEDENTS

7.1 On August 27, 2010, the Nuclear Regulatory Commission issued Amendment Nos. 278 and 281 to Renewed Facility Operating License Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The amendments consist of changes to the Technical Specifications in response to the Licensee's application dated August 31, 2009 (ADAMS Accession No. ML092470153). The amendments revised the PBAPS Units 2 and 3 TSs to adopt approved Technical Specification Task Force (TSTF) Traveler 425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - Risk-Informed Technical Specification Task Force Initiative 5b," (ADAMS Accession No. ML090850627)

7.2 On September 27, 2010, the Nuclear Regulatory Commission issued Amendment No. 276 to Renewed Facility Operating License No. DPR-16 for the Oyster Creek Nuclear Generating Station. The amendment consisted of changes to the Technical Specifications in response to the Licensee's application dated October 30, 2009, (ADAMS Accession No.

ML093060126), as supplemented by letters dated April 16, 2010, and August 31,2010 (ADAMS Accession Nos. ML101060560 and ML102430467, respectively). The amendment revised the Oyster Creek Technical Specifications to relocate a number of Surveillance Requirement frequencies to a licensee-controlled document.

8.0 REFERENCES

8.1 NRC Letter, "Notification of Issue with NRC-Approved Technical Specification Task Force (TSTF) Traveler 425, Revision 3, 'Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b,'" dated April 14, 2010 (ADAMS Accession No ML100990099).

ATTACHMENT 2 to TXX-11093

DOCUMENTATION OF PRA TECHNICAL ADEQUACY

1.0 Overview

This attachment addresses the assessment of the technical adequacy of the probabilistic risk assessment (PRA) that will be used to support the implementation of the Surveillance Frequency Control Program at Comanche Peak Nuclear Power Plant. The implementation of the Surveillance Frequency Control Program (also referred to as Technical Specification Initiative 5b) will follow the guidance provided in NEI 04-10, Revision 1 in evaluating proposed surveillance test interval (STI) changes.

The NEI 04-10 methodology requires plants to evaluate the adequacy of the PRA models used for this application following the guidance provided in Regulatory Guide 1.200, Revision 1, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." As discussed below, for this submittal, the guidance in Regulatory Guide 1.200, Revision 2 was used to demonstrate the technical adequacy of the parts of the PRA model used for this application and endorsed the Standard used for the recent Peer Review of the CPNPP model. Section 3 of the Regulatory Guide 1.200 provides guidance on demonstrating the technical adequacy of the PRA used to support the application. Section 4 describes the documentation to support this regulatory submittal, including both archival and submittal documentation.

Specifically, Section 3 requires that the description of the application include the following:

- SSCs [Systems, Structures and Components], operator actions, and plant operational characteristics affected by the application
- A description of the cause-effect relationships among the change and the above SSCs, operator actions, and plant operational characteristics
- Mapping of the cause-effect relationships onto PRA model elements
- Identification of the PRA results that will be used to compare against the applicable acceptance criteria or guidelines and how the comparison is to be made
- The scope of risk contributors (hazard groups and modes of operation) included in the PRA to support the decision

Since the scope of potential Initiative 5b applications (i.e., individual Surveillance Test Interval change evaluations) is very broad and the impact of various assumptions differs from application to application, the NEI 04-10 methodology provides that the above listed items be addressed with each STI interval change and documented in the supporting evaluation. The analysis process is described in detail in NEI 04-10 and plant-specific procedures are being developed to incorporate the NEI 04-10 requirements into Plant processes.

With regard to the above list, one item, namely, the scope of risk contributors (hazard groups and modes of operation) included in the PRA to support the decision, requires further discussion. The CPNPP PRA model that will be used for this application is the Level 1and Large Early Release Frequency (LERF) analysis of Internal Events, including Internal Flood, for At-Power operation, Revision 4A and subsequent revisions thereto. All other hazard groups and modes of operation will be addressed using the qualitative or bounding analysis techniques provided for in NEI 04-10, Revision 1. At the same time, Luminant has a long range plan to develop an integrated PRA model that will include other hazard groups and modes of operation. As these models are developed, they will be subjected to Peer Review and when it is determined that these meet the appropriate requirements of the applicable standard, these models will be used in the quantitative assessment of risk to support this application.

2.0 Technical Adequacy of the CPNPP PRA Model

The purpose of the remaining portion of this attachment is to demonstrate the technical adequacy of the PRA used in this application. This demonstration will be accomplished by providing the submittal documentation specified in Section 4.2 of Regulatory Guide 1.200.

Background

The CPNPP PRA model has been revised substantially since its origination and the various model revisions subjected to careful evaluation and review to assure the scope and quality of the model are adequate for planned risk informed applications. A discussion of these historical models and the associated reviews and assessments and their findings and dispositions was provided to the NRC in CP-200900520, TXX-09026 - R. Flores to Nuclear Regulatory Commission - Dated October 26, 2009 SUBJ: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) DOCKET NOS. 50-445 AND 50-446, LICENSE AMENDMENT REQUEST (LAR) 09-003, REVISION TO TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES - OPERATING," FOR A ONE-TIME, 14-DAY COMPLETION TIME FOR OFFSITE CIRCUITS. The historical reviews included two focused Peer Reviews, a full scope Peer Review, and a self-assessment to RG 1.200 Rev 1. These various reviews and assessments are part of the historical development and are available in archived documents for review.

These historical reviews provided important input to the recent model upgrade. The model upgrade addressed Level 1 and Large Early Release Frequency (LERF) analysis of Internal Events, including Internal Flood, for At-Power operation. This upgrade was initially embodied in the CPNPP Model of Record (MOR) Revision 4 which was completed in early 2011. The model was then submitted to a Pressurized Water Reactor Owner's Group (PWROG) full scope Peer Review in March 2011. The Peer Review was performed against the requirements of the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) PRA standard and any Clarifications and Qualifications provided in the Nuclear Regulatory Commission (NRC) endorsement of the Standard contained in Revision 2 to Regulatory Guide (RG) 1.200. Further, the Peer Review was performed using the process defined in Nuclear Energy Institute (NEI) 05-04. The Revision 4 model was further revised, in part, to incorporate the model changes in response to the Peer Review Findings & Observations (F&O) and issued as Revision 4A. Thus, the current MOR for Comanche Peak Nuclear Power Plant is PRA Model Revision 4A.

The PWROG Peer Review of the CPNPP PRA Model Revision 4 and the responses thereto embodied in Revision 4A provide a high degree of assurance of the technical adequacy of the CPNPP PRA model to support the implementation of the Surveillance Frequency Control Program at CPNPP. The outcome of the Peer Review showed that the CPNPP MOR 4 meets ASME Capability Category II or better for nearly all of the Supporting Requirements. After Findings and Observations were fully addressed through post-Peer Review model work and documentation, as reflected in CPNPP MOR 4A, all Supporting Requirements judged to have significance to Initiative 5b now meet Capability Category II or better. The Findings and Observations and their disposition, including Category I exceptions, are provided in Table 2-1 below.

In order to provide a more complete description of PRA technical adequacy, some specific elements of the historical PRA model warrant additional discussion. The principal historical issues are described below and have been fully addressed with the Peer Review and subsequent model Revision 4A. These are: 1) Recovery of Faulted Equipment, 2) Loss of Offsite Power (LOOP) Non-Recovery Probabilities, 3) Human Reliability Analysis (HRA), 4) Dependency Analysis, and 5) Data Analysis.

- Recovery of Faulted Equipment - Recovery of faulted equipment is no longer credited in the CPNPP PRA model. It was removed in the recent model upgrade (Revision 4).

- LOOP Non-Recovery Probabilities - Loss of Offsite Power (LOOP) non-recovery probabilities are now based on a lognormal rather than Weibull curve fit in the convolution integrals. This results in comparable non-recovery probabilities at shorter times and higher non-recovery probabilities at longer times after the LOOP event. In the current non-recovery analysis, database recovery values are limited such that there are no probabilities less than 1E-02.

- Human Reliability Analysis - A comprehensive upgrade of the HRA was done as part to the recent model upgrade. The current HRA is based on the Electric Power Research Institute (EPRI) HRA Calculator methodology. In all cases, screening values have been replaced. Detailed evaluations of Type 2 human errors (i.e., post initiator operator errors) based on operator event response were done and fully documented in the HRA Calculator.

- Dependency Analysis - A detailed dependency analysis was performed as part of the recent upgrade. The current dependency analysis is comprehensive and follows the current industry guidance provided in the EPRI HRA Calculator methodology.

- Data Analysis - A comprehensive data analysis was done as part of the current model upgrade. NUREG/CR-6928 data were used to establish priors for a Bayesian update. CPNPP Units 1 and 2 plant specific data were used to calculate the posterior probabilities.

<u>PRA Model Maintenance and Update</u>
Luminant employs a programmatic approach to establish and maintain the technical adequacy and plant fidelity of the PRA models. This approach includes both a detailed PRA maintenance and update process, and the use of self-assessments and independent peer reviews.

In addition, requirements are established for controlling the model and associated computer files, including, documentation of the PRA model and bases documents and electronic storage of PRA update information, PRA models, and PRA applications.

Further, guidelines are provided for updating the full power, internal events PRA models for CPNPP. Regularly planned PRA model updates nominally occur on an approximately 5-year cycle; longer intervals may be justified if it can be shown that the PRA continues to adequately represent the as-built, as-operated plant. CPNPP completed the Revision 4A MOR upgrade in 2011 which was a very comprehensive upgrade and included incorporation of various plant modifications into the previous PRA model of record, Revision 3E.

2.1 Required Submittal Documentation - Regulatory Guide 1.200, Revision 2, Section 4.2

As indicated previously, Regulatory Guide 1.200, Revision 2, Section 4.2, requires certain submittal documentation to demonstrate the technical adequacy of the PRA model used for the risk assessment. Each of these items will be discussed in turn.

<u>Model Represents the As-built and As-operated Plant</u>
The CPNPP PRA model was developed using programmatic controls to help assure that the model reflected the as-built and as-operated Plant, a process that included gathering detailed as-built and as-operated plant information and operating plant data, discussions with system engineers and operators, and plant walk down. The continuing PRA maintenance and update process ensures that the applicable PRA model remains an

accurate reflection of the as-built and as-operated plants. These processes are defined in the governing plant procedure ECE-2.15, and subordinate implementation guidelines. The procedure and guidelines define the processes for implementing regularly scheduled and interim PRA model updates, and for tracking issues identified as potentially affecting the PRA models (e.g., due to changes in the plant, errors or limitations identified in the model, software, industry operating experience, etc).

Plant Changes Not Yet Incorporated into the PRA Model

As of the date of the submittal of this LAR, there are no plant changes of significance that have not been incorporated into the PRA model; however, it is anticipated that from time to time, some additional plant changes will occur that ought to be reflected in the model. To this end, a PRA model update tracking database is created to identify and track plant changes that could impact the PRA model. Consistent with NEI 04-10, as part of the PRA evaluation for each Surveillance Test Interval change request, a review of open items in the tracking database will be performed and an assessment of the impact on the results of the application will be made prior to presenting the results of the risk analysis to the Integrated Decision-making Panel (IDP). If a nontrivial impact is expected, then this impact will be evaluated and may require the performance of additional sensitivity studies or model changes to confirm the impact on the risk analysis.

Consistency with Applicable PRA Standards

As indicated above, a full scope Peer Review of the CPNPP PRA Model Revision 4 was completed by the PWROG in March 2011 against the requirements of the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) PRA standard and any Clarifications and Qualifications provided in the Nuclear Regulatory Commission (NRC) endorsement of the Standard contained in Revision 2 to Regulatory Guide (RG) 1.200. The results of the Peer Review demonstrate that the model is consistent with the Standard and technically adequate to support the implementation of the Surveillance Frequency Control Program at CPNPP. The outcome of the Peer Review showed that the CPNPP MOR 4A meets ASME/ANS RA-Sa-2009 Parts 1, 2, and 3 Capability Category II or better for nearly all of the Supporting Requirements. After Findings and Observations were addressed through post-Peer Review model work and documentation, all Supporting Requirements judged to have significance to Initiative 5b now meet Capability Category II or better. The F&O Findings and their dispositions, including Category I exceptions, are provided in Table 2-1.

Summary of Risk Assessment Methodology

The risk assessment methodology for implementing the Surveillance Frequency Control Program at CPNPP will follow the guidelines of NEI 04-10 Revision 1. Plant-specific procedures are being developed which will incorporate the NEI 04-10 guidelines into Plant processes.

Identification of Key Assumptions and Approximations

For the CPNPP PRA MOR Revision 4A, key assumptions and approximations were identified and documented in the various notebooks. In addition, modeling uncertainties associated with scope or level of detail (modeling choices) for the baseline PRA are documented and validated in the respective notebooks; for example, the individual system models were analyzed with respect to the assumptions documented in the system notebooks to understand the impacts of those assumptions on the overall model. Finally, a comprehensive uncertainty analysis was done using a consensus methodology developed by EPRI and documented in Project Notebook R&R-PN-041. A brief discussion of the analyses is provided below.

As part of the PRA MOR Revision 4A development, a wide range of generic contributors to modeling uncertainties were examined in order to aid in the decision making process of potential applications. Each area of uncertainty is generally related to certain key assumptions and approximations associated with the model and each was characterized through sensitivity studies. The sensitivity studies provide a mechanism for meeting the ASME high level requirements and provide a better understanding of the model that will ultimately be used in the decision-making process supporting risk informed applications.

These contributors included:

- Generic Sources of Uncertainty (e.g., initiating event frequencies such as LOOP and Loss of Coolant Accident (LOCA)
- Support Systems Initiating Events and Recovery
- Unit Cross-Tie Recovery
- Overfill Recovery
- LOOP Recoveries
- Battery Life
- Test and Maintenance
- Human Reliability
- Reactor Coolant Pump (RCP) Seal LOCA
- Consequential LOOP
- Room Cooling
- Sump Plugging
- Power Operated Relief Valve (PORV) Operation / Pressure Relief Failure
- Common Cause Failures
- Interfacing System (IS) LOCA Failures

In addition, Major Component Importance Measures (i.e., Diesel Generators, 6.9 Kilovolt Components, and Cooling Water Components) were also examined. For these sensitivity studies, factors of 2 and 10 were typically used, although other factors were used where appropriate to gain the best insight. The results of these studies were tabulated and provide a summary source of information that can be used to gain insights into sensitivities associated with proposed test interval changes that affect these areas of the plant model. The results of these evaluations are documented in a separate uncertainty notebook.

For applications involving aspects that are outside the scope of the PRA model (completeness), the plan is either to perform bounding analyses or update the model to incorporate the missing scope elements. Lack of detail in the model generally leans toward a conservative bias which may be removed (by adding detail) if so required by a particular application. The completeness consideration is also recognized and addressed in the NEI 04-10 methodology.

Finally, the overall Initiative 5b process is a risk-informed process with the PRA model results providing one of the inputs to the IDP to determine if a Surveillance Test Interval (STI) change is warranted. The NEI 04-10 methodology recognizes that a key area of uncertainty for this application is the standby failure rate utilized in the determination of the STI extension impact. Therefore, the methodology requires the performance of selected sensitivity studies on the standby failure rate of the component(s) of interest and the associated common-cause failure rates for the STI assessment.

The results of the standby failure rate sensitivity study plus the results of any additional sensitivity studies identified during the performance of the reviews of each STI change assessment will be documented and included in the results of the risk analysis that is presented to the IDP.

Resolution of Peer Review Findings and Observations
The results of the PWROG Peer Review of the CPNPP PRA Model Revision 4 showed 21 Findings and 55 Observations / Suggestions and 4 Best Practices. The F&O Findings were resolved through model and / or documentation changes. When these were completed, the model was quantified and all the affected project notebooks were updated. The Peer Review Findings and their resolutions are presented in Table 2-1.

Identify Parts of the PRA that Conform to Capability Categories Lower Than Required for the Application

As noted above, Internal Events, Internal Flood, and Level 2/LERF are the parts of the PRA model that will be used for the quantitative analyses that support the Initiative 5b application. These parts of the model conform to capability categories required for Initiative 5b.

2.2 External Events Considerations

External hazards were evaluated in the CPNPP Individual Plant Examination for External Events (IPEEE) report which was submitted in response to the NRC IPEEE Program (Generic Letter 88-20, Supplement 4). The results of the CPNPP IPEEE are documented in the CPNPP IPEEE Main Report.

Luminant does not yet have quantifiable models for external hazards that meet the requirements of the ASME/ANS combined standard. However, the NEI 04-10 methodology provides that STI change evaluations can be performed in the absence of quantifiable PRA models for various hazards and modes. For those cases, the methodology provides that a qualitative or bounding analysis be performed to provide justification for the acceptability of the proposed test interval change. Therefore, in performing the assessments for the hazard groups and modes not included in the CPNPP MOR Revision 4A, the qualitative or bounding approach described in NEI 04-10 will be utilized.

3.0 Summary

The CPNPP PRA maintenance and update processes and technical capability evaluations described above provide a robust basis for concluding that the PRA is suitable for use in risk informed processes such as that proposed for the implementation of a Surveillance Frequency Control Program.

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
1-7 (including suggestion 6-5)	IFSN-A16 IFSN-A14	SW flood sources in the diesel generator rooms (1-084-SW and 1-085-SW), and as a result the areas themselves, were screened in part based on the availability of alarms indicating a pipe failure and the ability to isolate the break before the SW system would be lost resulting in an initiating event. However, credit for the operator isolation is not noted as part of the basis for screening the source and area in R&R-PN-021 Table 4.5-2. Assessment: Cat I is MET	In the original analysis, it was determined that a loss of a single Service Water (SW) train would cause a Technical Specification (TS) immediate plant shutdown due to the loss of an Charging pump. It was determined that there were viable operator actions to isolate the diesel generator SW without affecting the Charging pumps. After further consultation with plant licensed operators it was later concluded that the loss of a Charging pump function did not result in an immediate TS plant shutdown. The use of operator actions to screen these flood scenarios therefore was not necessary and the scenarios were required to be screened by other criteria. These rooms are now currently screened by the criteria that they do not cause an initiating event. Table 4.5-2 of R&R-PN-021 was revised to state that a loss of one emergency diesel generator and a single train of SW do not cause an immediate plant shutdown. The SW pipe break for the scenarios in question is assumed to occur in the diesel room. The flood in the diesel room will propagate outside the safeguards building and not cause a plant trip. No further analysis was conducted on these specific operator actions in question. Cat II or better based on this resolution
1-10	HR-E3 HR-E4 HR-G5 HR-I1	Documentation of past operator interviews was provided. The manner in which these interviews were performed is not documented so it is not clear that detailed talkthroughs were performed and in any case this information is from the 2003 time frame. This information was supplemented in the latest revision with specific questions to operations personnel that are documented in R&R-PN-020 Attachment 4. However, the documentation of the operator interviews is	Additional Operator interviews were performed as follows: The modeled Human Interactions fall into three general categories of response: 1) simple alarm response, 2) plant trip response using EOP/EOS procedures (i.e. typical response), and 3) response following loss of function using FR / ECA procedures. Several HIs from each category were selected as representative of the category. Standard briefing sheets and open ended response areas were prepared with the goal of confirming the response models (including timing) for modeled scenarios and that the PRA analyst's interpretation of

Table 2-1 F&O Summary Findings			
F&O Number	**Associated Supporting Requirement**	**F&O Details**	**Resolution**
		not judged by the review team to be sufficient to support peer review and model updates. Assessment: Cat II or better MET	procedures was consistent with plant observations and training procedures. The briefing packages were used to capture the interview observations of three Operations Unit Supervisors (i.e. 3 crews). For each modeled action, the Unit Supervisors stepped through the associated procedures, including timing estimates and crew dynamics where appropriate. The Operations Support Supervisor (current SRO) also provided "EOPs for Engineers" training for the PRA analysts. This training covered EOP usage and operations protocols including training standards, timing standards, etc. The Operations Support Supervisor also provided response and timing information for a number of specific modeled actions. The results from these interviews were consistent with the modeled HFEs and did not require significant changes to any HEPs. Cat II or better MET
1-11	HR-G7 HR-H3 QU-C2	The top 7 HFE combinations appearing in the quantification results were reviewed. Three had incorrect ordering of the independent failures (i.e., the wrong HFE in the combination was assigned as the independent failure) and one had an incorrect assignment of complete dependence. An example of a combinations with the incorrect assignment of the independent failure is TLXHICOMB106. In this combination, the first event should be TLXHISGPSLLY based on review of the event tree. However, TLXHICOND45Y is treated as the independent event in calculating the combined HEP. The correct sequencing of the events would lead to a different outcome for the joint probability. In addition, one of the reviewed combinations, revealed that	The HRA dependency analysis was completely revised. An updated version of the HRA Calculator® allowed intervening successes and local delay timings to be adjusted so as to correctly assign the independent failure. All HFEs were reviewed to insure that a consistent definition of time zero (T_0) was used and that cues were appropriate for the accident sequence context where the combination appears. As stated previously, delay times for individual actions within a combination were locally adjusted when necessary to provide the correct ordering of actions for the dependency analysis. All combinations were reviewed to confirm that the correct HFE had been designated as the independent event. All combinations were reviewed to verify that intervening successes had been properly identified.

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		complete dependence was assigned for actions with an intervening success. For example, HFEs TLXHIHPR13SY, Failure to Align High Pressure Recirculation, and TLXHIEOS13SY, Failure to align Low Pressure Recirculation are assigned complete dependence (TLXHICOMB111). However, in the context of the sequence, there is an intervening success in this sequence (Secondary Depressurization) which would result in the HFEs being assessed as independent. Assessment: HR-G7 was NOT MET	Cat II or better based on this resolution
1-12	QU-D4 LE-F2	R&R-PN-035 Section 5.8 compares the total LERF for CPNPP with several other Large Dry Containment 4-loop PWRs. However, there is no comparison at the level of significant contributors or plant damage states. Without the comparison of contributor information, it is not really possible to determine how similar the LERF results are to other plants and whether excessive conservatisms have skewed the results. For example, the contribution to LERF from early containment failure is significantly higher than usually found for large dry containments. This may be valid for CPNPP and based on some plant-specific design feature, but it does not appear that there was consideration of the possibility that this is driven by modeling assumptions rather than design. Assessment: LE-F2 was NOT MET	A comparison of the LERF results to plants of similar design at the significant contributor and PDS levels was added to R&R-PN-035 and RXE-LA-CPX/0-105. This comparison shows that the CPNPP LERF results are reasonable based on plant specific features and thermal hydraulic analysis. Cat II or better based on this resolution
1-16	HR-I3	R&R-PN-020 Section 3 is titled "Assumptions and Sources of Uncertainty." However, those assumptions that are sources of uncertainty are not clearly identified.	R&R-PN-020, §3.0 has been subdivided into 3 subsections dealing with modeling choices, assumptions, and source of uncertainty. The sources of uncertainty have been verified to be characterized under QU-F4 as described in PN-041.

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		Assessment: Cat I - III MET	Cat I - III MET
2-8	SC-A6	For SGTR, there appears to be no consideration of the case where an MSSV opens following the SGTR (not as a result of overfill) and sticks open, allowing the SG to depressurize. Assessment: Cat I - III MET	Additional plant specific thermal-hydraulic analysis performed for SGTR case with stuck open MSSV. No changes to success criteria or model logic were necessary. Cat I - III MET
2-12	AS-A4 AS-A5 AS-A7 AS-A10 AS-C2	The model uses a simple, two sequence event tree for all transient groups. This is not fundamentally a problem, since it is possible to build the event-specific plant response into the sequence top logic. However, in order to do that, the event-specific progression needs to be discussed in detail, the possible sequences defined, and each possibility either qualitatively argued away as a non-contributor or implemented in the logic model. This has not been done. Unlike the non-transient initiators, the format of the discussion for the transient initiators is that a single detailed discussion is provided for a general progression. This is followed by brief discussions of some of the other initiating event groups, but not in sufficient detail such that the progression can be clearly understood. The Main Steamline Break (MSLB) discussion touches on the qualitative basis for not addressing failure to isolate the MSLB, but there is insufficient justification and it does not affect the actual impact of single and multiple SG blowdown (for example, is make-up required to compensate for primary shrinkage to prevent drawing a bubble into the RCS piping). This is finally followed by a single discussion of the ERG actions relevant to transients, but again this is only general in nature and does not present specific information on the different actions and procedures that are used for the various initiating event groups and how those could impact	The transient initiating event group discussion in R&R-PN-013 has been divided into sub-groups based on EOP progression. Each sub-group section discusses specific progression, timing, system states, procedures used, and operator actions. The sub-sections have been formatted similar to the other initiating events and include an ERG Actions portion that is specific to the sub-group. Model logic has been re-verified to confirm that no possible sequences have been excluded. Additional analysis has verified that failure to isolate single or multiple steamlines following a MSLB will not uncover the core, thus not requiring success criteria different from the overall transient group.

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		both plant and operator response (which would necessitate inclusion in the top logic). Assessment: AS-C2 was NOT MET; Assessment: AS-A10 was Cat I	Cat II or better based on this resolution
2-13	AS-A7 AS-C3	Key sources of model uncertainty and assumptions related to the accident sequence modeling are documented in R&R-PN-013, Section 3. There are some sources of uncertainty that are missing. For example: 1. The way offsite power recovery is handled in the accident sequences is not discussed as a potential source of uncertainty. The model assumes that, once offsite power is recovered the sequence is over. Therefore, the actual recovery and operation of the mitigating systems after power recovery may introduce unique failures that are not addressed in LOOP sequences without SBO. In particular, after recovery of offsite power many things have to be done manually that would occur automatically for LOOP without SBO, and some equipment will be in a different state (i.e., handswitches in pull-to-lock). 2. While WCAP-15831 may be considered a "consensus" ATWS model, the WCAP includes consideration of ATWS from power levels less than 40% (States 1 and 2) that are not addressed in the CPNPP model. While these may be lesser contributors to the ATWS risk (~10%), the omission of parts of the "consensus" model does constitute a potential source of uncertainty that needs to be addressed. In addition, WCAP-15831 Section 8.2 states that "ATWS events can be initiated from a wide range of initiating events. The ATWS analysis for	1. Additional discussion of offsite power recovery modeling and sequence development added to R&R-PN-039, App. E as follows: "A consideration of the off-site power recovery scheme is successful recovery and what happens once power is recovered. First, the methodology applies a non-recovery probability to the LOOP initiating event. That is, the cutset containing this initiating event has a probability associated with failure to recover power within a defined time frame. This failure leads to core damage. Second, if power recovery is successful, the additional failures required to lead to core damage produce cutsets that are non-minimal to the cutset with failed power recovery or another cutset, which would thus be subsumed from the cutset file. The logic allows for the LOOP initiator to propagate through the model with the on-site AC power available. This generates cutsets that consider many of the additional failures associated with restarting and loading equipment or additional manual actions that may be required. For example, the following two cutsets are generated by the current methodology. Cutset one: LOOP IE, CCF of both EDGs, non-recovery probability Cutset two: LOOP IE, TDAFW FTS, CCF of MDAFW, CCP

Table 2-1 F&O Summary Findings			
F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		Westinghouse PWRs (Reference 6) established that the limiting events, with regard to RCS peak pressure, are the loss of load with subsequent loss of all MFW and complete loss of normal feedwater. These limiting events are both assumed to be initiated from normal operation at full power." It is further stated in Section 8.2.1 that "The model presented in this section assumes MFW is lost for all anticipated transient events. If MFW continues to operate, then the event does not need to address the pressure relief response, including AFW and AMSAC, but only requires long-term shutdown. A split that accounts for MFW continuing to operate may be added to plant specific ATWS models if desired." it is not clear that the modeling for the LOMFW top event captures all potential losses of MFW following the initiating event. For example, flood events INIT-F0-AUXSWA and INIT-F0-AUXSWB, as analyzed, would trip the CW pumps due to actuation of the flood sensing switches in the condenser pits resulting in a loss of condenser coincident with the reactor trip. However, these are treated as transients with MFW available in the ATWS analysis. In addition, random failure of MFW following reactor trip is not addressed in the fault tree logic for top event LOMFW (this was included in the Braidwood model described in Section 9.1 of the WCAP). Therefore, it is not clear that the CPNPP modeling is entirely consistent with the "consensus" model and the potential uncertainty introduced by the deviations is not discussed.	A FTS, PORV B FTO With no AFW and 1 PORV failed to open, success criteria will require 2 CCPs. If off-site power was successfully recovered in cutset number one and the scenario continued, the cutset would look like: Cutset three: LOOP IE, CCF of both EDGs, power recovered, TDAFW FTS, CCF of MDAFW, CCP A FTS, PORV B FTO The quantification software would look at cutset three and cutset two and identify that cutset three was non-minimal to cutset two and remove it before the results would be written to the cutset file. Thirdly, if the model logic was modified to account for the successful restoration of off-site power, cutsets may be generated that contain unique failures after recovery that does not apply before recovery. That is, that after recovery of offsite power many actions may have to be done manually that would occur automatically for LOOP without SBO, and some equipment will be in a different state. For example, 1) Loop IE, CCF of Both EDGs, Operator fails to establish FW after recovery of power, 2) Loop IE, CCF of Both EDGs, CCF of normal power tie breakers to safety busses to close or 3) Loop IE, CCF of Both EDGs, Operator fails to properly sequence loading of busses. For these remaining cases, the impact on CDF would be insignificant. This can be seen by looking at the overall

Table 2-1 F&O Summary Findings			
F&O Number	**Associated Supporting Requirement**	**F&O Details**	**Resolution**
			make-up of these non-generated cutsets. For CPNPP the LOOP initiating event frequency is approximately E-2, the CCF of the EDGs is approximately E-4, providing an E-6 starting point probability. A best estimate of successful LOOP recovery prior to core damage would lower these cutsets by at least an order of magnitude, resulting in an E-7 cutset probability. For non-operator failure based scenarios, because of redundancy and/or diversity of equipment/success paths, at least two additional failures would have to occur in order to cause core damage. This would provide at least an E-4 failure probability. For operator failure based scenarios, given that once off-site power is restored, the focus of the staff would be on re-energizing the safety busses, followed by restoration of mitigating equipment and systems. Therefore a failure probability of E-3 would be an appropriate value based on current similar HRA analyses. This would put the non-generated cutsets in the E-10 to E-11 range (or lower) for a given core damage scenario. Given the current model CDF value (~3E-06) and the contribution of LOOP (~ 10 to 15 percent) to CDF, these scenarios would not significantly contribute to overall CDF." The above information has been added to the Quantification Support File Notebook, R&R-PN-039. 2. The ATWS event tree has been revised to pass all anticipated transient events discussed in the WCAP (i.e. no loop, no ISI) through the LOMFW logic. The split accounting for MFW continuing to operate has been removed. Concerning LOOP, the WCAP further states (§5.4): "Since

Table 2-1 F&O Summary Findings			
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		Assessment: AS-A7 was NOT MET	the impacts on CDF and RCS integrity from LOSP/AWTS events are very small, this event will not be important to the plant risk profile or to risk-informed decision process for assessing changes to a plant." Regarding states 1 and 5 (low power), WCAP §5.4 also states: "Since the CDF and the impact on CDF are dominated by ATWS state 3 / 4 this state is the most important one to consider in plant specific PRA models. The other modes of operation are small contributors to plant risk and will not be important to the plant specific risk profile or to the risk-informed decision process for assessing changes to a plant." The results of the WCAP show that states 1 and 5 contribute less than 2.5% to ATWS risk. Since ATWS risk at CPNPP is a 0.1% contributor, the potential contribution to overall CDF risk from ATWS states 1 and 5 is on the order of 0.0025%. The uncertainty due to exclusion of ATWS states 1 and 5 is therefore confirmed to be insignificant to plant specific risk profile or to the risk-informed decision process for assessing changes to the plant. The above information has been added to the Accident Sequence notebook, R&R-PN-013. Cat II or better based on this resolution
2-16	HR-C2 HR-D2 HR-E2 HR-F2 HR-G2	R&R-PN-020 Section 4.1.2 states that "In general, caution was exercised when considering both an error of omission (EOM) and an error of commission (EOC) for the same activity. For most component manipulations, these activities were judged to be mutually exclusive. For example in the case of a repositioning a valve following a test, an error of omission skips the reposition. This would be a reasonable error. An error or commission, however would be to reposition the valve, i.e. the desired outcome, and is not considered." This is insufficient basis for	All HFEs have been re-analyzed to include appropriate Errors of Commission.

Table 2-1 F&O Summary Findings			
F&O Number	**Associated Supporting Requirement**	**F&O Details**	**Resolution**
		excluding EOC. EOC could include (for this example) "repositioning" the wrong valve (correct intent, wrong action). This same thought process was applied to the EOC for post-initiator actions and was also not adequately justified. Assessment: HR-C2 was NOT MET	Cat II or better based on this resolution.
2-18	HR-H3 QU-C1	The process followed for dependency analysis utilizes the HRA Calculator® to identify the combinations of HFEs that appear in cutsets. The process used a quantification run with a truncation level of 1E-14 to identify the HFE combinations to assessed, but used nominal HEP values so it cannot be assured that all important combinations were identified. Assessment: QU-C1 was NOT MET	The cut set used in the re-analysis of dependency was generated by setting all HEPs to 1E-01 and re-quantifying at 1E-12, (which meets the ASME PRA Standard for setting a truncation value). Additional combinations were obtained and appropriately analyzed for dependency. 1E-01 is generally at least two orders of magnitude higher than the HEP values and is sufficiently elevated to identify important combinations. Cat II or better based on this resolution
3-1	IE-C5 IE-D2	From a methodology point of view, and per report R&R-PN-008A, Rev 4, with the exception of the LOOP initiators, a reactor year basis and an appropriate availability factor was used. So, it is deemed that the analysis meets the CC-I/II as a whole. However, because LOOP, as stated in section 4.7 of R&R-PN-008A, Rev 4, uses a calendar year basis instead of a reactor year, an F&O was generated to document the need to convert the LOOP initiating events to reactor year based frequencies. Assessment: IE-C5 was CAT I/II	LOOP IE frequencies were adjusted to a reactor year basis and all other IE frequencies were re-verified to be calculated on a reactor year basis and documented in R&R-PN-008A. Cat II or better based on this resolution
4-1	IE-A1 IE-A4 IE-A5 IE-A7 IE-B2	In general, the initiating event analysis seems to have identified a representative set of initiating events. However, the following areas were identified where the documentation was missing or deficient in the current revision:	1. The Initiating Event Analysis (PN-003) was revised to document the system-by-system initiating event review used to identify potential system initiating events. In addition, R&R-PN-003 was also upgraded to incorporate the documentation of the IE-D2 supporting requirement

Table 2-1 F&O Summary Findings			
F&O Number	**Associated Supporting Requirement**	**F&O Details**	**Resolution**
	IE-C3 IE-C11 IE-D2	1. Appendix D of R&R-PN-008A (Rev. 3A) documents a systematic evaluation of each system to identify potential system initiating events. R&R-PN-024 contains the support system initiators that include SW, CCW, CH and switchyard. It seems the systematic evaluation was performed, but not documented in detail in Revision 4 of R&R-PN-003 or R&R-PN-008A. (IE-A1, IE-A5, IE-B2) 2. Page 20 of R&R-PN-008A (Attachment 5) contains a summary of the plant-specific initiating event experience. However, the treatment of events resulting in an unplanned controlled shutdown that includes a scram prior to reaching low-power conditions is not discussed. (IE-A7) 3. Section 8.0 of R&R-PN-003 refers to a review of Licensee Event Reports (LERs), covering the period from September of 1988 through May of 1998, to identify any industry initiating events which could not be placed in one of the identified Initiating Event categories. There is no documentation in the notebook providing details of this review such that it can be independently verified or reconsidered during future model updates. (IE-A4) 4. Recovery through cross-tie of the Unit 1 and Unit 2 SW and CCW systems (SWXTIE and CCWXTIE respectively) is credited in the Support System Initiating Event Fault Trees. However, this is not documented in R&R-PN-003 or R&R-PN-024. (IE-C3, IE-C11)	elements. 2. Added following text to R&R-PN-008A, §4.0: "A review of recent (see §4.2) plant operating experience was performed to identify occurrences of initiating events since the previous update. The only screening criterion used in this review was that a plant trip would not be counted if it was a planned event as part of a planned shutdown for refueling. In addition to at-power events, the review also looked for shutdown events that could also occur at power and events occurring during an unplanned controlled shutdown that resulted in a trip prior to reaching low power conditions." 3. NUREG/CR-6928 provides a reasonable expectation of common initiators for PWRs. A few of these initiators are not applicable to CPNPP. Similarly, CPNPP has a small number of "unique" initiators that have been added due to analysis or plant experience. Attachment 1 of R&R-PN-008A contains the mapping between IE's from industry sources and the CPNPP PRA model. R&R-PN-008A, §4.0 has the following summary: "Development of the initial CPNPP PRA model included a comprehensive search for initiating events and was documented in R&R-PN-003. Additionally, 2411 NRC LERs from September 1988 to May 1998 were re-reviewed during the revision to R&R-PN-003. All events could be placed within one of the existing initiating event categories. This search process is not repeated for PRA updates since the general set of PWR initiators is well established. A general search of recent industry events (INPO Operational Transients database and Ref. 2.7) did not identify any previously unseen types of initiating events. Review of references 2.1, 2.17, 2.18, 2.19 did not identify any initiators that are not included in the

Table 2-1 F&O Summary Findings			
F&O Number	**Associated Supporting Requirement**	**F&O Details**	**Resolution**
			model, or any precursors that would indicate potential initiators were overlooked. Existing initiating event groups are consistent with other United States PWRs and do not require modification for this update. The initiator list bounds plant experience. The model freeze date for this update is 6/30/08. Attachment 1 is a summary of the updated internal initiating event frequencies. The calculations shown in Attachments 3-7 are documented in Excel spreadsheet "Rev4_Initiating_Events.xls". Calculations are performed as instructed in Ref. 2.5. A review of recent (see §4.2) plant operating experience was performed to identify occurrences of initiating events since the previous update. The only screening criterion used in this review was that a plant trip would not be counted if it was a planned event as part of a planned shutdown for refueling. In addition to at-power events, the review also looked for shutdown events that could also occur at power and events occurring during an unplanned controlled shutdown that resulted in a trip prior to reaching low power conditions. This review identified 7 plant trips during the period under consideration. These trips are listed in Attachment 5. No events were screened out during this review, nor were any initiating events identified that are not included in the current model. The system engineers were also interviewed to determine if the system models were missing any potential indicators.

Table 2-1
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F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		Assessment: IE-D2 was NOT MET	None were identified. The interviews are documented in ref. 2.42." Similarly, Operations reviewed the initiating event list during the updated operator interview. No changes were identified. 4. All SW and CCW crosstie recovery credit has been removed from the Support System Initiating Event fault trees. Cat II or better based on this resolution
4-4 Suggestion	IE-A8 IE-D2	The following reviews for identification of potential initiating events: Interviews with plant personnel were not performed to determine if potential initiators have been overlooked. Assessment: IE-A8 was Cat I	Following text added to §4.0 of R&R-PN-008A: "The system engineers were interviewed to determine if the system models were missing any potential indicators. None were identified. The interviews are documented in R&R-PN-008A. Several Operations shift supervisors reviewed the list of current initiating events to determine if any potential initiating events had been overlooked. None were identified." Cat II or better based on this resolution
4-12	DA-D4 DA-E2	Section 4.3 of R&R-PN-008 states that the resulting posterior distributions were reviewed and "any inconsistencies examined by comparing them to prior and plant experience. Results were determined to be reasonable based on the weight of evidence." However, there is no documentation associated with this review. Assessment: Cat I - III MET	Review results from the comparison of the ratio derived from plant specific data with prior mean values has been added to R&R-PN-008. Cat I - III MET
4-13	SY-B1 DA-D6	Section 4.5 of R&R-PN-008 states that a review of industry data sources and relative risk importance for SYSIMP groups supported deletion of eight common cause groups. The deleted CCF "component types" were fans, dampers, air compressors, bistables and non-safety batteries.	The statement on review of common cause groups was incorrectly interpreted to indicate screening or exclusion. This statement in R&R-PN-008 has been clarified as follows: "To support the definition of common cause groups, component types were reviewed against industry data sources and relative risk importance for SYSIMP groups. No CCF

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		Assessment: Cat II or better MET	events associated with significant basic events were excluded in the definition of common cause groups." Cat II or better MET
4-14	DA-D3 DA-E2	The CPNPP PRA includes mean values and statistical representations of the uncertainty intervals for the parameter estimates. However, the uncertainty parameters for the CCF events are not included. Assessment: Cat III MET	The Multiple Greek Letter method for estimating CCF mean values is a method adopted from NUREG 5485 which is cited as a source in the ASME standard. Though this method does not readily support statistical representation of uncertainty intervals, other sources of uncertainty have been considered. As noted in Appendix D.5 of NUREG 5485, "the uncertainties due to judgment required in interpretation and classification of failure events and the assessment of impact vectors are the most significant of all sources of uncertainty." This discussion of uncertainty for CCF parameter estimation has been added to R&R-PN-008. The data notebook includes an explicit reference to R&R-PN-041, Uncertainty Analysis, which addresses EPRI recommendations for treatment of uncertainty. Cat III MET
4-15	DA-C4 DA-D1	The CPNPP PRA includes many SSCs with plant-specific parameter estimates (see Attachment 3 of R&R-PN-008). However, there is no documented systematic process or criteria to determine which SSCs should be evaluated for the plant-specific estimates, including the potentially significant basic events. Assessment: Cat II or better MET	A systematic review of plant specific data identified those components with sufficient, relevant plant data. All components with sufficient data were updated to generate plant specific parameter estimates. Data sources reviewed for changes in failures or failure modes included Maintenance Rule, Mitigation System Performance Indicator (MSPI), EPIX and consultations with System and Component Engineers. This discussion of the update process and criteria was added to R&R-PN-008. Cat II or better MET
4-24	IE-B5 IE-C3	Sections 5.2.1, 5.2.2, 5.2.3, 5.2.4 of R&R-PN-022 discuss the cutset reviews performed for CPNPP PRA. Issues were	1. The treatment of room cooling was reviewed and determined to be correctly applied, i.e. individual room

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F&O Number	Associated Supporting Requirement	F&O Details	Resolution
	IE-C11 QU-D1	identified with two specific cutsets that require additional discussion and/or justification: 1. Cutset #9 in the CDF results contains two events (RHACHCOOL & RHBCHCOOL) which represent the conditional probability a RH train will fail upon loss of the essential chilled water that provide the room cooling. Each event has the conditional probability of 0.688 based on the RXE-SY-CP1/1-028 (1992). It is not clear whether this conditional probability is justifiable. In addition, it seems the RHACHCOOL & RHBCHCOOL events should be based on a joint probability when these two events show together in a cutset. (QU-D1) 2. Cutset #10 contains SWXTIE that credits Unit 2 SW system upon Loss of SW system in Unit 1 followed by an induced RCP Seal LOCA which would result in a start signal for the EDGs. It is not clear whether the operators have enough time to make the crosstie in time to provide the cooling to EDGs on Unit 1 before the diesels fail. (IE-B5, IE-C3, IE-C11, QU-D1) Assessment: QU-D1 was NOT MET	heat loads are different, thus different probabilities are reasonable. However, due to the uncertainty regarding potential dependency, cutsets containing failures of both trains are treated as completely dependent. A replacement event equal to the highest probability of the pair is substituted in place of the independent events. A sensitivity case [R&R-PN-041] has been performed to address the uncertainty of this assumption. Further discussion of this topic is addressed in App. D of R&R-PN-039. 2. All SW and CCW crosstie recovery credit has been removed from the Support System Initiating Event fault trees. R&R-PN-024 discusses credit for cross-ties to mitigate core damage but not in determining the SSIE frequencies. This crosstie function is credited as a recovery only with both trains in the other unit available. As modeled, one train from the other unit cannot be used to supply both units. Use of the crosstie does not prevent inducing an RCP Seal LOCA; nor does it prevent operators from taking required actions (e.g. stopping the EDGs on a loss of SW) prior to alignment of the crosstie. Cat II or better based on this resolution
4-29 Suggestion	QU-A2 QU-D6 QU-F3	Section 6.0 of R&R-PN-022 provides the discussions of the significant contributors to CDF, the initiator contributions, and top event contributors for each event tree. Section 7.0 of R&R-PN-022 provides significant contributors from CCF events, operator actions and independent events. However, the sequence level contributors are not indentified in the notebook. Assessment: QU-F3 was Cat I	Discussion of significant sequences has been added to R&R-PN-022. Cat II based on this resolution
4-31	QU-E4	R&R-PN-041 provides the results of uncertainty and	R&R-PN-041 Section 5.1 describes the application of the EPRI

Table 2-1 F&O Summary Findings			
F&O Number	**Associated Supporting Requirement**	**F&O Details**	**Resolution**
	QU-F4	sensitivity results, and other PRA notebooks identify the potential sources of model uncertainty. However, it is not clear how these sources of uncertainty affect the PRA model. Assessment: QU-F4 was NOT MET	approach to CPNPP. Cat II based on this resolution
4-34	QU-F6	No documentation was found in R&R-PN-022, 39 and 41 providing a quantitative definition of significant basic event, cutset, and accident sequence. Assessment: QU-F6 was NOT MET	The quantitative definition for significant basic event, significant cutset, and significant accident sequence is as described in ASME/ANS PRA Standard, part 2. This definition has been explicitly added to R&R-PN-022, 039, and 041. Cat II based on this resolution
4-35	IE-C8 IE-C10 DA-C16	The CCW, SW, and CH initiating event fault trees use a MTTR factor, which is calculated based on the data from the Maintenance Rule database. It is not clear whether the data screening was appropriately handled for the initiating event criteria. In addition, the MTTR factor is applied using rules based recovery rather than being explicitly modeled in the SSIE fault trees as required by this SR.	The data used to calculate the MTTR value were screened to identify unavailability events not associated with planned test and maintenance. Detailed data includes dates, durations and the reason for unavailability. A table detailing screen results was added to R&R PN-008. MTTR events are explicitly included in SSIE models. The following is included in R&R-PN-024, §4.1: "Each SSIE tree has been developed such that every train is modeled with the operating equipment relying on an annualized exposure time. At an appropriate location, where the trains meet in the logic, an event representing the mean time to repair of the redundant train was placed. This event effectively replaces the annualized value of the redundant equipment with the MTTR exposure time. In this way, the logic will always result in a yearly frequency at the top while any of the operating trains may represent the initial annualized failure. An example of this approach is shown below, and each MTTR event used in the model is subsequently discussed.

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		Assessment: IE-C10 was NOT MET	Standby equipment with relevant failure modes and common-cause failure events are modeled with an MTTR of 24 hours so that the mitigating logic may be used directly in most cases (see Section 3.2). These events, therefore, are modeled such that they bypass the additional MTTR events. (Common-cause failures are discussed in Section 6.0.) Other dual-train failure modes (such as shared tank ruptures) receive the yearly exposure which propagates to the top without further manipulation. Cat II based on this resolution
6-4	IFSN-A6	RG 1.200 Revision 2 documents a qualified acceptance of this SR. The NRC resolution states that to meet Capability Category II, the impacts of flood-induced mechanisms that are not formally addressed (e.g., using the mechanisms listed under Capability Category III of this requirement) must be qualitatively assessed using conservative assumptions. Assessment: IFSN-A6 was Cat I based on the qualification in RG 1.200, Revision 2	As noted, the qualitative analysis of impingement, pipe whip, humidity, and condensation concerns was not conducted for the PRA flood model; CPNPP previously completed a design basis High Energy Line Break (HELB) calculation. Since most of the high energy systems are located in compartments that are segregated from the rest of the plant by watertight doors and have flood paths directly to the plant yard there should be minimal impact to PRA equipment. A qualitative analysis of these conditions will be performed on as needed basis. Assessment: remains at Cat I
6-7	IFQU-A6	The human actions taken from the main control room during flooding scenarios (listed in Table 4.9-1) were judged to not incur additional stress above the same actions when analyzed for the internal events analysis. This judgment is based on: (1) the components and cues not being affected by the flood, (2) the actions being based on steps as defined in a procedure, (3) the operators being highly trained in executing the procedure steps (many are memorized as immediate actions), and (4) the actions being backed up by	The nineteen HFE's that appear in flood cutsets were re-reviewed. Eleven of these HIs are performed in the control room and are simple actions (e.g. start an alternate pump, stop a pump, etc) in response to an alarm or EOP. The judgment is that these actions are not impacted by flood scenarios because they are simple, occur shortly after the trip, and are within the EOP. We strongly believe that the Operators will stay within the ERG network, as trained, until they have stabilized the plant. Further these events occur early enough that stress levels are

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		supervision in the control room during the flooding scenario. Additionally, most of the actions are assumed to be taken early in a sequence before the determination that a flood is occurring (an average time frame of 10 minutes is assumed). Thus, few of the actions are expected to be taken in the long term as a scenario progresses. Certainly, the components in the control room (those physically manipulated by the operators) should not be affected by the flood scenarios. The lack of impact on cues is not certain. All the actions appear to be based on procedural guidance for which the operators are trained. Control room supervision is expected. However, the assumption regarding the actions being taken early within a scenario does not apply to several of the main control room actions that are listed in Table 4.9-1. At least nine actions from Table 4.9-1 were identified which could reasonably be expected to be performed in a time frame beyond the assumed, average 10 minutes. Among these actions were: - The failure to establish feed-and-bleed within 25 (or 30) minutes - The failure to align for low pressure recirculation (up to 41.8 minutes) - The failure to align for hot leg recirculation (up to 270 minutes) - The failure to start a standby SW pump (up to 37 minutes) - The failure to depressurize and begin RHR SDC (up to 1433 minutes)	judged to be unchanged from the level originally assessed for the event. WOG ERGs are symptom based. That is, the operators respond to plant indications rather than performing diagnosis of the event. No specific time limit is applied to this review. One HFE concerns equipment failed due to flooding. The HFE is therefore N/A. The remaining 7 actions have some portion of the response performed remotely (i.e. in the field). The general process was to increase transit time where the flood could cause the PEO to stop and have additional discussion with the control room and/or re-route to the destination. In lieu of more specific information, the transit time was doubled. Changing timing in the HRA methodology may change the dependency of recovery actions, with potential subsequent increase in the Human Error Probability (HEP). This approach was judged reasonable since the actions that were modified already include the effects of high stress in the base analysis. Three of the seven are not impacted by flood scenarios. TLXHICSTFILY and AFXHICSTFILY are "refill the CST" actions and do not occur for at least 5.5 hours after plant trip. In this case the flood impacts are assumed to be terminated. EPXHICHASW_Y does not occur in a flood area. Four of the seven remote actions were judged to be potentially impacted by the flood. The potential impact was judged to likely be an increase in transit time due to additional communication with the control room or the need to take an alternate path. For these cases, transit time was doubled. Where appropriate, dependency levels were changed as a result of increased timing. In two of the four events the dependency

Table 2-1
F&O Summary Findings

F&O Number	Associated Supporting Requirement	F&O Details	Resolution
		Assessment: Cat I - III MET	level did not change, thus the HEP did not change. In the remaining two events, the dependency level increased, thus increasing the associated HEP. Cat I - III MET
No F&O included	IFEV-A6	R&R-PN-021 Section 4.7 indicates that the flood initiating event frequencies were based on the EPRI 1021086 failure data combined with plant-specific piping lengths. No Bayesian updating with plant-specific operating experience or adjustment based on engineering judgment was performed. Assessment: Cat I is MET	During the internal flooding (IF) analysis a search for previous IF events at CPNPP was performed and none were found. A Bayesian update with no specific plant events would incur a non-conservative result; therefore no Bayesian update was performed as there is no impact to application evaluations. Assessment: remains at Cat I
No F&O included	LE-C11	No credit was taken for continued operation of equipment after containment failure. RXE-LA-CPX/0-105 Table 6-1 specifically notes that "No credit is taken for operation of the ECCS/CS system after containment failure or for operator actions or other equipment that could be impacted by containment failure because there are none that are significant." It is not clear that this is equivalent to justifying "any credit given" as required for CC II/III. Assessment: Cat I is MET	Since no credit has been taken for continued operation after containment failure, justification cannot be provided. Impact on specific applications will be evaluated as needed. Assessment: remains at Cat I
2-7 (Suggestion F&O)	SC-A6	The MAAP calculations (RXE-LA-CPX/0-103 and RXE-LA-CPX/0-104) are generally consistent with features and procedures. However, the requirement for switchover to hot leg recirculation is conservative, and may impact the CDF results and, thus, the insights on dominant contributors.	To address the conservatism, Hot Leg Recirculation requirements were removed for Small and Very Small LOCA based on Westinghouse ERG documents and comparison with other plants.

Table 2-2
SRs Assessed as Not Met or Category I for the CPNPP PRA

Technical Element	Not Met SRs	Cat I SRs
Initiating Event (IE)	IE-C10 IE-D2	IE-A8
Accident Sequence Analysis (AS)	AS-A7 AS-C2	AS-A10
Success Criteria (SC)	None	None
Systems Analysis (SY)	None	None
Human Reliability (HR)	HR-C2 HR-G7	None
Data Analysis (DA)	None	None
Internal Flooding (IF)	None	IFSN-A6* IFSN-A14 IFSN-A16 IFEV-A6
Quantification (QU)	QU-C1 QU-D1 QU-F4 QU-F6	QU-F3
Large Early Release Frequency (LE)	LE-F2	LE-C11
Maintenance &Update/Configuration Control (MU)	None	None

ATTACHMENT 3 to TXX-11093

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Pages	TS INSERTS	3.3-27	3.4-30	3.7-15	3.8-14
	3.1-1	3.3-36	3.4-33	3.7-16	3.8-15
	3.1-3	3.3-39	3.4-34	3.7-18	3.8-16
	3.1-5	3.3-44	3.4-38	3.7-21	3.8-22
	3.1-9	3.3-48	3.4-40	3.7-22	3.8-24
	3.1-11	3.3-49	3.4-41	3.7-25	3.8-25
	3.1-13	3.3-53	3.5-2	3.7-28	3.8-31
	3.1-18	3.4-2	3.5-4	3.7-30	3.8-32
	3.2-4	3.4-3	3.5-5	3.7-33	3.8-34
	3.2-6	3.4-5	3.5-9	3.7-34	3.8-36
	3.2-9	3.4-6	3.5-10	3.7-41	3.8-38
	3.2-10	3.4-8	3.6-6	3.7-43	3.8-40
	3.2-13	3.4-9	3.6-12	3.7-46	3.9-1
	3.3-8	3.4-11	3.6-13	3.8-6	3.9-3
	3.3-9	3.4-13	3.6-14	3.8-7	3.9-5
	3.3-10	3.4-15	3.6-15	3.8-8	3.9-7
	3.3-11	3.4-17	3.6-16	3.8-9	3.9-9
	3.3-12	3.4-22	3.6-17	3.8-10	3.9-11
	3.3-13	3.4-23	3.7-7	3.8-11	3.9-12
	3.3-25	3.4-27	3.7-9	3.8-12	5-5-16
	3.3-26	3.4-28	3.7-14	3.8-13	

TS INSERTS

INSERT 1

In accordance with the Surveillance Frequency Control Program.

INSERT 2

5.5.21 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.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 SDM shall be within the limits provided in the COLR.

APPLICABILITY: MODE 2 with $k_{eff} < 1.0$,
MODES 3, 4, and 5

-----NOTE-----
While this LCO is not met, entry into MODE 5 from MODE 6 is not permitted.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM to be within limits.	~~24 hours~~

INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.2.1	-----------------------------------NOTE----------------------------------- The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. --- Verify measured core reactivity is within ± 1% $\Delta k/k$ of predicted values.	Once prior to entering MODE 1 after each refueling AND ----------NOTE--------- Only required after 60 EFPD ---------------------------- ~~31 EFPD thereafter~~

INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify MTC is within upper limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	-----NOTES----- 1. Not required to be performed until 7 effective full power days (EFPD) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. 2. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle. 3. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of ≤ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR. ---------- Verify MTC is within lower limit.	~~Once each cycle~~

INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3.	6 hours
D. More than one rod not within alignment limit.	D.1.1 Verify SDM to be within the limits provided in the COLR.	1 hour
	OR	
	D.1.2 Initiate boration to restore required SDM to within limit.	1 hour
	AND	
	D.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	~~12 hours~~
SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.	~~92 days~~ INSERT 1
SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. T_{avg} ≥ 500°F; and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank is within the limits specified in the COLR.	~~12 hours~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Control bank sequence or overlap limits not met.	B.1.1 Verify SDM to be within the limits provided in the COLR. OR B.1.2 Initiate boration to restore SDM to within limit. AND B.2 Restore control bank sequence and overlap to within limits.	1 hour 1 hour 2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.2	Verify each control bank insertion is within the limits specified in the COLR.	~~12 hours~~
SR 3.1.6.3	Verify sequence and overlap limits specified in the COLR are met for control banks not fully withdrawn from the core.	~~12 hours~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. RCS lowest operating loop average temperature not within limit.	C.1 Restore RCS lowest operating loop average temperature to within limit.	15 minutes
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform a CHANNEL OPERATIONAL TEST on power range and intermediate range channels per SR 3.3.1.7, SR 3.3.1.8, and Table 3.3.1-1.	Prior to initiation of PHYSICS TESTS
SR 3.1.8.2	Verify the RCS lowest operating loop average temperature is ≥ 541°F.	~~30 minutes~~
SR 3.1.8.3	Verify THERMAL POWER is ≤ 5% RTP.	~~1 hour~~
SR 3.1.8.4	Verify SDM is within the limits provided in the COLR.	~~24 hours~~

INSERT 1

SURVEILLANCE REQUIREMENTS

-----NOTE-----

During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved at which a power distribution measurement is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify $F_Q^C(Z)$ is within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 20% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified AND ~~31 EFPD thereafter~~

INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 20% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified AND ~~31 EFPD thereafter~~

INSERT 1

SURVEILLANCE REQUIREMENTS

-----NOTE-----
During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved at which a power distribution measurement is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify $F^N_{\Delta H}$ is within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND ~~31 EFPD thereafter~~

INSERT 1

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)

LCO 3.2.3 The AFD in % flux difference units shall be maintained within the limits specified in the COLR.

---NOTE---
The AFD shall be considered outside limits when two or more OPERABLE excore channels indicate AFD to be outside limits.

APPLICABILITY: MODE 1 with THERMAL POWER $\geq$ 50% RTP

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AFD not within limits.	A.1 Restore THERMAL POWER to < 50% RTP.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD is within limits for each OPERABLE excore channel.	~~7 days~~

INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.4.1	-----NOTES----- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. ---------- Verify QPTR is within limit by calculation.	~~7 days~~
SR 3.2.4.2	-----NOTE----- Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP. ---------- Verify QPTR is within limit using the core power distribution measurement information.	~~12 hours~~

INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
T. One or more required channel(s) inoperable.	T.1 Verify interlock is in required state for existing unit conditions. OR T.2 Be in MODE 2.	1 hour 7 hours
U. One trip mechanism inoperable for one RTB.	U.1 Restore inoperable trip mechanism to OPERABLE status. OR U.2 Be in MODE 3.	48 hours 54 hours
V. Not used.		

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	~~12 hours~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.2	-----NOTE----- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. ---------- Compare results of calorimetric heat balance calculation to NIS Power Range channel and N-16 Power Monitor channel outputs. Adjust NIS Power Range channel outputs if calorimetric heat balance calculation exceeds NIS Power Range channel outputs by more than +2% RTP. Adjust N-16 Power Monitor channel outputs if calorimetric heat balance calculation exceeds N-16 Power Monitor channel outputs by more than +2% RTP.	~~24 hours~~ INSERT 1
SR 3.3.1.3	-----NOTE----- Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. ---------- Compare results of the core power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 3%.	~~31~~ ~~effe~~ctive full power days ~~(EFPD)~~
SR 3.3.1.4	-----NOTE----- This Surveillance must be performed on the reactor trip bypass breaker for the local manual shunt trip only prior to placing the bypass breaker in service. ---------- Perform TADOT.	~~62 days on a STAGGERED TEST BASIS~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.1.6	-----NOTE----- Not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 75% RTP. ----- Calibrate excore channels to agree with core power distribution measurements.	~~92 EFPD~~ INSERT 1
SR 3.3.1.7	-----NOTES----- 1. Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. 2. Source range instrumentation shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ----- Perform COT.	~~184 days~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.8	-----NOTE----- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	the previous Frequency specified in the SFCP -----NOTE----- Only required when not performed within ~~previous 184 days~~ ---------- Prior to reactor startup <u>AND</u> 12 hours after reducing power below P-10 for power and intermediate instrumentation <u>AND</u> Four hours after reducing power below P-6 for source range instrumentation <u>AND</u> ~~Every 184 days~~ thereafter INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.9	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	~~92 days~~
SR 3.3.1.10	----------NOTES---------- 1. N-16 detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Prior to entry into MODES 2 or 1, N-16 detector plateau verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP. ---------- Perform CHANNEL CALIBRATION.	~~18 months~~ INSERT 1
SR 3.3.1.11	----------NOTES---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Prior to entry into MODES 2 or 1, power and intermediate range detector plateau verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP. ---------- Perform CHANNEL CALIBRATION.	~~18 months~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.12	Not used.	
SR 3.3.1.13	Perform COT.	~~18 months~~ INSERT 1
SR 3.3.1.14	------NOTE------ Verification of setpoint is not required. ------ Perform TADOT.	~~18 months~~ INSERT 1
SR 3.3.1.15	------NOTE------ Verification of setpoint is not required. ------ Perform TADOT.	Prior to exceeding the P-9 interlock whenever the unit has been in MODE 3, if not performed ~~in~~ the previous Frequency specified in the SFCP ~~previous 31 days~~
SR 3.3.1.16	------NOTE------ Neutron and N-16 detectors are excluded from response time testing. ------ Verify RTS RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. One or more required channel(s) inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	OR	
	L.2.1 Be in MODE 3.	7 hours
	AND	
	L.2.2 Be in MODE 4.	13 hours

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.2.3	Not Used.	INSERT 1
SR 3.3.2.4	Perform MASTER RELAY TEST.	~~92 days on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.5	Perform COT.	~~184 days~~
SR 3.3.2.6	Perform SLAVE RELAY TEST.	~~92 days~~ ~~OR~~ ~~18 months for Westinghouse type AR relays with AC coils~~
SR 3.3.2.7	----------NOTES---------- 1. Verification of relay setpoints not required. 2. Actuation of final devices not included. -------------------- Perform TADOT.	~~31 days~~
SR 3.3.2.8	----------NOTE---------- Verification of setpoint not required for manual initiation functions. -------------------- Perform TADOT.	~~18 months~~
SR 3.3.2.9	----------NOTE---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. -------------------- Perform CHANNEL CALIBRATION.	~~18 months~~

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.10	---NOTE--- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is $\geq$ 532 psig. ------ Verify ESF RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~
SR 3.3.2.11	---NOTE--- Verification of setpoint not required. ------ Perform TADOT.	~~18 months~~

INSERT 1

SURVEILLANCE REQUIREMENTS

-----NOTE-----
SR 3.3.3.1 and SR 3.3.3.3 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~
SR 3.3.3.2	Deleted	INSERT 1
SR 3.3.3.3	Perform CHANNEL CALIBRATION.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~
SR 3.3.4.2	Verify each required HSP power and control circuit and transfer switch is capable of performing the intended function.	~~18 months~~ INSERT 1
SR 3.3.4.3	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	Perform ACTUATION LOGIC TEST.	Prior to entering MODE 4 when in MODE 5 for ≥ 72 hours and if not performed in ~~previous 92 days~~ the previous Frequency specified in the SFCP
SR 3.3.5.2	-----NOTE----- Setpoint verification is not applicable. ----- Perform TADOT.	Prior to entering MODE 4 when in MODE 5 for ≥ 72 hours and if not performed in ~~previous 92 days~~
SR 3.3.5.3	Perform CHANNEL CALIBRATION.	~~18 months~~
SR 3.3.5.4	Verify LOP DG start ESF RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~

INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ------------NOTE------------ Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. -------------------------------	---------------------NOTE--------------------- The containment pressure relief valves may be opened in compliance with the gaseous effluent monitoring instrumentation requirements in Part I of the ODCM. --	
Required Action and associated Completion Time for Condition A not met.	C.1 Place and maintain containment ventilation valves in closed position.	Immediately
	OR	
	C.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment ventilation isolation valves made inoperable by isolation instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Ventilation Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	~~12 hours~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.2	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.6.3	Perform MASTER RELAY TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.6.4	Perform COT.	~~92 days~~
SR 3.3.6.5	Perform SLAVE RELAY TEST.	~~92 days~~ INSERT 1 ~~OR~~ ~~18 months for Westinghouse type AR relays with AC coils~~
SR 3.3.6.6	Not Used.	
SR 3.3.6.7	Perform CHANNEL CALIBRATION.	~~18 months~~

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.7-1 to determine which SRs apply for each CREFS Actuation Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.7.2	Perform COT.	~~92 days~~
SR 3.3.7.3	Not Used.	
SR 3.3.7.4	Not Used.	
SR 3.3.7.5	Not Used.	INSERT 1
SR 3.3.7.6	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	~~18 months~~
SR 3.3.7.7	Perform CHANNEL CALIBRATION.	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. --------------NOTE-------------- Only applicable prior to exceeding 85% RTP after a refueling outage. ------------------------------------ Measured RCS Flow not within limits.	B.1 Maintain THERMAL POWER less than 85% RTP.	Immediately
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is ≥ the limit specified in the COLR.	~~12 hours~~
SR 3.4.1.2	Verify RCS average temperature is ≤ the limit specified in the COLR.	~~12 hours~~
SR 3.4.1.3	Verify RCS total flow rate is ≥ 389,700 and ≥ the limit specified in the COLR.	~~12 hours~~ INSERT 1
SR 3.4.1.4	----------------------------------NOTE---------------------------------- Not required to be performed until after exceeding 85% RTP after each refueling outage. --- Verify by precision heat balance that RCS total flow rate is ≥ 389,700 and ≥ the limit specified in the COLR.	~~18 months~~

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each operating RCS loop average temperature (T_{avg}) shall be ≥ 551°F.

APPLICABILITY: MODE 1,
MODE 2 with k_{eff} ≥ 1.0

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. T_{avg} in one or more operating RCS loops not within limit.	A.1 Be in MODE 2 with k_{eff} < 1.0.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify RCS T_{avg} in each operating loop ≥ 551°F.	~~12 hours~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. --------------NOTE-------------- Required Action C.2 shall be completed whenever this Condition is entered. ------------------------------------		
Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limits.	Immediately
	AND	
	C.2 Determine RCS is acceptable for continued operation.	Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.3.1	---------------------------------NOTE--------------------------------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. --	
	Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.	~~30 minutes~~ INSERT 1

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops -- MODES 1 and 2

LCO 3.4.4 Four RCS loops shall be OPERABLE and in operation.

APPLICABILITY: MODES 1 and 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify each RCS loop is in operation.	~~12 hours~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One required RCS loop not in operation, with Rod Control System capable of rod withdrawal.	C.1 Restore required RCS loop to operation. OR C.2 Place the Rod Control System in a condition incapable of rod withdrawal.	1 hour 1 hour
D. Four RCS loops inoperable. OR No RCS loop in operation.	D.1 Place the Rod Control System in a condition incapable of rod withdrawal. AND D.2 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1. AND D.3 Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	~~12 hours~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	Verify steam generator secondary side water levels are ≥ 38% (Unit 1) and ≥ 10% (Unit 2) for required RCS loops.	~~12 hours~~
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	~~7 days~~ INSERT 1

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RHR or RCS loop is in operation.	~~12 hours~~
SR 3.4.6.2	Verify SG secondary side water levels are ≥38% (Unit 1) and ≥10% (Unit 2) for required RCS loops.	~~12 hours~~ INSERT 1
SR 3.4.6.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	~~7 days~~

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	~~12 hours~~
SR 3.4.7.2	Verify SG secondary side water level is ≥38% (Unit 1) and ≥10% (Unit 2) in required SGs.	~~12 hours~~ INSERT 1
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	~~7 days~~

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≤ 92%.	~~12 hours~~
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters is ≥ 150 kW.	~~18 months~~

INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. More than one block valve inoperable.	---NOTE--- Required Actions do not apply when block valve is inoperable solely as a result of complying with Required Actions B.2 or E.2.	
	F.1 Place associated PORVs in manual control.	1 hour
	AND	
	F.2 Restore one block valve to OPERABLE status	2 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1 Be in MODE 3.	6 hours
	AND	
	G.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	---NOTES--- 1. Not required to be performed with block valve closed in accordance with the Required Action of this LCO. 2. Not required to be performed prior to entry into MODE 3.	
	Perform a complete cycle of each block valve.	~~92 days~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.11.2	-----NOTE----- Not required to be performed prior to entry into MODE 3. ----- Perform a complete cycle of each PORV.	INSERT 1 ~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One required RCS relief valve inoperable in MODE 5 or 6.	F.1 Restore required RCS relief valve to OPERABLE status.	24 hours
G. Two required RCS relief valves inoperable. OR Required Action and associated Completion Time of Condition A, B, D, E, or F not met. OR LTOP System inoperable for any reason other than Condition A, B, C, D, E, or F.	G.1 Depressurize RCS and establish RCS vent of ≥ 2.98 square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	~~12 hours~~ INSERT 1
SR 3.4.12.2	Verify a maximum of two charging pumps are capable of injecting into the RCS.	~~12 hours~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.3	Verify each accumulator is isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.	~~12 hours~~
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	~~72 hours~~
SR 3.4.12.5	Verify required RCS vent ≥ 2.98 square inches open.	~~12 hours for unlocked open vent valve(s)~~ ~~AND~~ ~~31 days for locked open vent valve(s)~~
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	~~72 hours~~
SR 3.4.12.7	Not Used.	INSERT 1
SR 3.4.12.8	---------------------------------NOTE--------------------------------- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ 350°F. --- Perform a COT on each required PORV, excluding actuation.	~~31 days~~
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.13.1	-----NOTES----- 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. ----- Verify RCS operational LEAKAGE is within limits by performance of RCS water inventory balance.	~~72 hours~~ INSERT 1
SR 3.4.13.2	-----NOTE----- Not required to be performed until 12 hours after establishment of steady state operation. ----- Verify primary to secondary LEAKAGE is ≤150 gallons per day through any one SG.	~~72 hours~~ INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.14.1	-----NOTES----- 1. Not required to be performed in MODES 3 and 4. 2. Not required to be performed on the RCS PIVs located in the RHR flow path when in the shutdown cooling mode of operation. 3. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. -----	
	Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2215 psig and ≤ 2255 psig.	In accordance with the Inservice Testing Program, and ~~18 months~~ INSERT 1 AND Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, and if leakage testing has not been performed in the previous 9 months except for valves 8701A, 8701B, 8702A and 8702B AND Within 24 hours following check valve actuation due to flow through the valve

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.14.2	Verify RHR System interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 442 psig, except when the valves are open to satisfy LCO 3.4.12.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate and gaseous radioactivity monitors.	~~12 hours~~
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate and gaseous radioactivity monitors.	~~92 days~~
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required Containment Sump Level and Flow Monitoring System.	~~18 months~~ INSERT 1
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate and gaseous radioactivity monitors.	~~18 months~~
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment air cooler condensate flow rate monitor.	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. OR DOSE EQUIVALENT I-131 > 60 μCi/gm.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	-----NOTE----- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 500 μCi/gm.	INSERT 1 ~~7 days~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. ------------------------------ Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 0.45 μCi/gm.	INSERT 1 ~~14 days~~ AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.16.3	DELETED	DELETED

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	~~12 hours~~
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 6119 gallons and ≤ 6597 gallons.	~~12 hours~~
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 623 psig and ≤ 644 psig.	~~12 hours~~
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2300 ppm and ≤ 2600 ppm.	~~31 days~~ INSERT 1 AND ----------NOTE--------- Only required to be performed for affected accumulators --------------------------- Once within 6 hours after each solution volume increase of ≥ 101 gallons that is not the result of addition from the refueling water storage tank
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is > 1000 psig.	~~31 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more trains inoperable for reasons other than one inoperable centrifugal charging pump. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1 Restore train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed. Number / Position / Function 8802 A&B / Closed / SI Pump to Hot Legs 8809 A&B / Open / RHR to Cold Legs 8835 / Open / SI Pump to Cold Legs 8840 / Closed / RHR to Hot Legs 8806 / Open / SI Pump Suction from RWST 8813 / Open / SI Pump Miniflow Valve	~~12 hours~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.2	Verify each ECCS 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 3.5.2.3	Verify ECCS piping is full of water.	Prior to entry into MODE 3
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ INSERT 1
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each mechanical position stop is in the correct position. Valve Number 8810A 8816A 8822A 8810B 8816B 8822B 8810C 8816C 8822C 8810D 8816D 8822D	~~18 months~~
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet strainers show no evidence of structural distress or abnormal corrosion.	~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.4.1	-----NOTE----- Only required to be performed when ambient air temperature is < 40°F or > 120°F. ---------- Verify RWST borated water temperature is ≥ 40°F and ≤ 120°F.	~~24 hours~~
SR 3.5.4.2	Verify RWST borated water volume is ≥ 473,731 gallons.	~~7 days~~ INSERT 1
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2400 ppm and ≤ 2600 ppm.	~~7 days~~

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow shall be ≤ 40 gpm with RCS pressure ≥ 2215 psig and ≤ 2255 psig and the charging flow control valve full open.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow within limit with RCS pressure ≥ 2215 psig and ≤ 2255 psig and the charging flow control valve full open.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.5.1	-----NOTE----- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig. ---------- Verify manual seal injection throttle valves are adjusted to give a flow within limit with RCS pressure ≥ 2215 psig and ≤ 2255 psig and the charging flow control valve full open.	INSERT 1 ~~31 days~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	-----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. ----- Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	~~24 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1	Verify each 48 inch Containment Purge and 12 inch Hydrogen Purge valve is sealed closed, except for one purge valve in a penetration flow path while in Condition D of this LCO.	~~31 days~~ INSERT 1
SR 3.6.3.2	Not used.	
SR 3.6.3.3	-----NOTES----- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. ---------- Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	~~31 days~~
SR 3.6.3.4	-----NOTES----- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. The blind flange on the fuel transfer canal need not be verified closed except after each drainage of the canal. ---------- Verify each containment isolation manual valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.5	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.6	Not used.	
SR 3.6.3.7	------------------------------NOTE------------------------------ This surveillance is not required when the penetration flow path is isolated by a leak tested blank flange. --- Perform leakage rate testing for containment purge, hydrogen purge and containment pressure relief valves with resilient seals.	~~18 months~~ INSERT 1
SR 3.6.3.8	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~
SR 3.6.3.9	Not used.	
SR 3.6.3.10	Not used.	
SR 3.6.3.11	Not used.	
SR 3.6.3.12	Not used.	
SR 3.6.3.13	Not used.	

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ - 0.3 psig and ≤ + 1.3 psig.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1	Verify containment pressure is within limits.	~~12 hours~~ INSERT 1

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be ≤ 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limit.	A.1 Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	~~24 hours~~ INSERT 1

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours
C. Two containment spray trains inoperable.	C.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray 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

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.2	Not used.	
SR 3.6.6.3	Not used.	
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	~~18 months~~
SR 3.6.6.7	Not used.	INSERT 1
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	Following maintenance which could result in nozzle blockage

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	-----NOTE----- Only required to be performed in MODES 1 and 2. ---------- Verify the isolation time of each MSIV is ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.7.2.2	-----NOTE----- Only required to be performed in MODES 1 and 2. ---------- Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more FIV or FCV bypass valves inoperable.	C.1 Close or isolate bypass valve. AND C.2 Verify bypass valve is closed or isolated.	72 hours Once per 7 days
D. Two valves in the same flowpath inoperable	D.1 Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.3.1	Verify the isolation time of each FIV, FCV, and associated bypass valves is ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.7.3.2	Verify each FIV, FCV, and associated bypass valves actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.5.1	----------NOTE---------- AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. ------------------------ Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.5.2	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after $\geq$ 532 psig in the steam generator. ------------------------ Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice testing Program
SR 3.7.5.3	----------NOTE---------- AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. ------------------------ Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.4	-----NOTES----- 1. Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 532 psig in the steam generator. 2. AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW operation. ----- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~

INSERT 1

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

LCO 3.7.6 The CST level shall be ≥ 53%.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST level not within limit.	A.1 Verify by administrative means OPERABILITY of backup water supply.	4 hours AND Once per 12 hours thereafter
	AND	
	A.2 Restore CST level to within limit.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 4	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST level is ≥ 53%.	~~12 hours~~

INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	---NOTE--- Isolation of CCW flow to individual components does not render the CCW System inoperable. --- Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ INSERT 1
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	-----NOTE----- Isolation of SSWS flow to individual components does not render the SSWS inoperable. ----- Verify each SSWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ INSERT 1
SR 3.7.8.2	Verify one complete cycle of each required cross-connect valve that is not locked open.	~~92 days~~
SR 3.7.8.3	Verify each SSW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The Safe Shutdown Impoundment (SSI) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SSI level less than required.	A.1 Restore SSI level to within limits.	7 days
B. Required Action and associated Completion Time of Condition A not met. OR SSI inoperable for reasons other than Condition A.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of SSI is ≥ 770 ft mean sea level.	~~24 hours~~
SR 3.7.9.2	Verify station service water intake temperature is ≤ 102°F.	~~24 hours.~~

INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.10.1	Operate each CREFS trains Emergency Pressurization Unit for ≥ 10 continuous hours with the heaters operating and Emergency Filtration Unit ≥ 15 minutes.	~~31 days~~
SR 3.7.10.2	Perform required CREFS testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP INSERT 1
SR 3.7.10.3	Verify each CREFS train actuates on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.10.4	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 3.7.11.1	Verify each CRACS train has the capability to remove the assumed heat load.	~~18 months~~

INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.12.1	Operate each ESF Filtration train for ≥ 10 continuous hours with the heaters operating.	~~31 days~~
SR 3.7.12.2	Perform required ESF Filtration Unit filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.3	Verify each PPVS train actuates on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.12.4	Verify one PPVS train can maintain a pressure ≤ -0.05 inches water gauge relative to atmospheric pressure during the post accident mode of operation.	~~18 months on a STAGGERED TEST BASIS~~
SR 3.7.12.5	Not used.	
SR 3.7.12.6	Verify each PPVS non-ESF fan stops on an actual or simulated actuation signal.	~~18 months~~

INSERT 1

3.7 PLANT SYSTEMS

3.7.15 Fuel Storage Area Water Level

LCO 3.7.15 The fuel storage area water level shall be ≥ 23 ft over the top of the storage racks

APPLICABILITY: During movement of irradiated fuel assemblies in a spent fuel storage area.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage area water level not within limit.	A.1 ------------------NOTE------------------ LCO 3.0.3 is not applicable. -- Suspend movement of irradiated fuel assemblies in the fuel storage area.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the fuel storage area water level is ≥ 23 ft above the top of the storage racks.	~~7 days~~ INSERT 1

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Boron Concentration

LCO 3.7.16 The fuel storage pool boron concentration shall be ≥ 2000 ppm.

APPLICABILITY: When fuel assemblies are stored in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool boron concentration not within limit.	------NOTE------ LCO 3.0.3 is not applicable. ------------------	
	A.1 Suspend movement of fuel assemblies in the fuel storage pool	Immediately
	<u>AND</u>	
	A.2 Initiate action to restore fuel storage pool boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	~~7 days~~ INSERT 1

3.7 PLANT SYSTEMS

3.7.18 Secondary Specific Activity

LCO 3.7.18 The specific activity of the secondary coolant shall be ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1	Verify the specific activity of the secondary coolant is ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.	~~31 days~~ INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.19.1	------------------------------NOTE------------------------------ Isolation of safety chilled water flow to individual components does not render the safety chilled water system inoperable. -- Verify each safety chilled water manual, power operated, and automatic valve servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ INSERT 1
SR 3.7.19.2	Verify each safety chilled water pump and chiller starts on an actual or simulated actuation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.20.1	Verify each required UPS & Distribution Room Fan Coil Unit operates ≥ 1 continuous hour.	~~31 days~~
SR 3.7.20.2	Verify each required UPS A/C train operates for ≥ 1 continuous hour.	~~31 days~~ INSERT 1
SR 3.7.20.3	Verify each required UPS A/C train actuates on an actual or simulated actuation signal.	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Three or more required AC sources inoperable.	H.1 Enter LCO 3.0.3.	Immediately
I. One Blackout Sequencer inoperable	I.1 Declare associated DG inoperable	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	~~7 days~~ INSERT 1
SR 3.8.1.2	---NOTES--- 1. Performance of SR 3.8.1.7 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 3.8.1.7 must be met. --- Verify each DG starts from standby conditions and achieves steady state voltage $\geq$ 6480 V and $\leq$ 7150 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	~~31 days~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	------------------------------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 3.8.1.2 or SR 3.8.1.7. --- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 6300 kW and ≤ 7000 kW.	~~31 days~~
SR 3.8.1.4	Verify each day tank contains ≥ 1440 gal of fuel oil.	~~31 days~~
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	~~31 days~~ INSERT 1
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from storage tank to the day tank.	~~92 days~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	-----NOTE----- All DG starts may be preceded by an engine prelube period. ----- Verify each DG starts from standby condition and achieves: a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz; and b. steady state, voltage ≥ 6480 V and ≤ 7150 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~ INSERT 1
SR 3.8.1.8	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----- Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate required offsite circuit.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	-----------------------------------NOTE----------------------------------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. --- 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 $\leq$ 66.75 Hz; and b. Within 3 seconds following load rejection, the voltage is $\geq$ 6480 V and $\leq$ 7150 V.	~~18 months~~ INSERT 1
SR 3.8.1.10	Verify each DG does not trip and voltage is maintained $\leq$ 8280 V during and following a load rejection of $\geq$ 6300 kW and $\leq$ 7000 kW.	~~18 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	-----NOTES----- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. -----	
	Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤10 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 6480 V and ≤ 7150 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.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.12	-----NOTE----- All DG starts may be preceded by prelube period. ----- Verify on an actual or simulated Safety Injection (SI) actuation signal each DG auto-starts from standby condition and; a. in ≤ 10 seconds after auto-start and during tests, achieves voltage ≥ 6480 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 6480 V and ≤ 7150 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes.	~~18 months~~ INSERT 1
SR 3.8.1.13	-----NOTE----- For Unit 2, testing need only be performed for LOOP concurrent with SI until startup following 2RFO5. ----- Verify each DG's automatic trips are bypassed on actual or simulated (i) loss of voltage signal on the emergency bus, and (ii) SI actuation signal, except: a. Engine overspeed; and b. Generator differential current.	~~18 months~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.14	------------------------------NOTE------------------------------ Momentary transients outside the load and power factor ranges do not invalidate this test. -- Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 6900 kW and ≤ 7700 kW; and b. For the remaining hours of the test loaded ≥ 6300 kW and ≤ 7000 kW.	~~18 months~~ INSERT 1
SR 3.8.1.15	------------------------------NOTES------------------------------ 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 6300 kW and ≤ 7000 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. -- Verify each DG starts and achieves: a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz; and b. steady state, voltage ≥ 6480 V and ≤ 7150 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.16	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----- 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.	~~18 months~~ INSERT 1
SR 3.8.1.17	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated SI actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	~~18 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.18	-----------------------------------NOTE----------------------------------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---	
	Verify interval between each sequenced load block is within ± 10% of design interval for each automatic load sequencer.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	-------------------------------NOTES------------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. --	
	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated SI actuation 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 load sequencer, 3. achieves steady state voltage ≥ 6480 V and ≤ 7150 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.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	-----NOTE----- All DG starts may be preceded by an engine prelube period. ---------- Verify when started simultaneously from standby condition, each DG achieves: a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz, and b. steady state, voltage ≥ 6480 V, and ≤ 7150 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~10 years~~
SR 3.8.1.21	Calibrate BO sequencers.	~~18 months~~
SR 3.8.1.22	-----NOTES----- 1. Verification of setpoint is not required. 2. Actuation of final devices is not included. ---------- Perform TADOT for SI and BO sequencers.	~~31 days on a STAGGERED TEST BASIS.~~

INSERT 1

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	----------NOTE---------- Not required to be performed until the engine has been shutdown for > 10 hours. ---------- Verify lubricating oil inventory is ≥ a 7 day supply	~~31 day~~
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 pressure is ≥ 180 psig.	~~31 days~~ INSERT 1
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and Associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	~~7 days~~
SR 3.8.4.2	Verify each battery charger supplies ≥ 300 amps at greater than or equal to the minimum established charger test voltage for ≥ 8 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.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.3	-----NOTES----- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. Verify requirement during MODES 3, 4, 5, 6 or with core off-loaded. ----- 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.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met. OR One or two batteries on one train with one or more battery cells float voltage < 2.07 V and float current > 2 amps.	F.1 Declare associated battery(ies) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	---NOTE--- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1 --- Verify each battery float current is ≤ 2 amps.	~~7 days~~
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	~~31 days~~ INSERT 1
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~31 days~~

3.8 ELECTRICAL POWER SYSTEMS

	SURVEILLANCE	FREQUENCY
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~31 days~~
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ 2.07 V.	~~92 days~~
SR 3.8.6.6	------NOTE------ Verify requirement during MODES 3, 4, 5, 6 or with core off-loaded. ------ Verify battery capacity is ≥ 80 % of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	INSERT 1 ~~60 months~~ <u>AND</u> 18 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 the expected life with capacity ≥ 100% of manufacturer's rating

3.8 ELECTRICAL POWER SYSTEMS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, and alignment to required AC vital buses.	~~7 days~~ INSERT 1

3.8 ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignments to required AC vital buses.	~~7 days~~ INSERT 1

3.8 ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	~~7 days~~ INSERT 1

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status.	Immediately
	<u>AND</u>	
	A.2.5 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	~~7 days~~ INSERT 1

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of all filled portions of the Reactor Coolant System, the refueling canal, and the refueling cavity, that have direct access to the reactor vessel, shall be maintained within the limit specified in the COLR.

-----NOTE-----
While this LCO is not met, entry into MODE 6 from MODE 5 is not permitted.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2 Suspend positive reactivity additions.	Immediately
	<u>AND</u>	
	A.3 Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	~~72 hours~~ INSERT 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.2.1	Verify each valve that isolates unborated water sources is secured in the closed position.	~~31 days~~ INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.9.3.2	-------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	INSERT 1 ~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	~~7 days~~
SR 3.9.4.2	-------------------------------NOTE------------------------------- Only required for an open equipment hatch --- Verify the capability to install the equipment hatch.	INSERT 1 ~~7 days~~
SR 3.9.4.3	Verify each required containment ventilation isolation valve actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 3800 gpm.	~~12 hours~~ INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No RHR loop in operation.	B.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.	Immediately
	AND	
	B.2 Initiate action to restore one RHR loop to operation.	Immediately
	AND	
	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 1000 gpm.	~~12 hours~~ INSERT 1
SR 3.9.6.2	Verify correct breaker alignment and indicated power available to the required RHR pump that is not in operation.	~~7 days~~

3.9 REFUELING OPERATIONS

3.9.7 Refueling Cavity Water Level

LCO 3.9.7 Refueling cavity water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling cavity water level not within limit.	A.1 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify refueling cavity water level is ≥ 23 ft above the top of reactor vessel flange.	~~24 hours~~ INSERT 1

5.5 Programs and Manuals

5.5.20 Control Room Envelope Habitability Program (continued)

b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following are exceptions to Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0:

1. C. - Section 4.3.2 "Periodic CRH Assessment" from NEI 99-03 Revision 1 will be used as input to a site specific Self Assessment procedure.

2. C.1.2 - No peer reviews are required to be performed.

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CREFS, operating at the flow rate required by the VFTP, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 18 month assessment of the CRE boundary.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

INSERT 2

ATTACHMENT 4 to TXX-11093

PROPOSED TECHNICAL SPECIFICATIONS BASES CHANGES
(Mark-up For Information Only)

Pages	BASES INSERT	B 3.3-49	B 3.3-143	B 3.4-68	B 3.6-38	B 3.7-91	B 3.8-52
	B 3.1-4	B 3.3-50	B 3.3-144	B 3.4-72	B 3.7-12	B 3.8-14	B 3.8-63
	B 3.1-10	B 3.3-51	B 3.3-149	B 3.4-73	B 3.7-18	B 3.8-15	B 3.8-64
	B 3.1-24	B 3.3-52	B 3.3-150	B 3.4-80	B 3.7-29	B 3.8-16	B 3.8-65
	B 3.1-29	B 3.3-53	B 3.4-5	B 3.4-85	B 3.7-30	B 3.8-17	B 3.8-70
	B 3.1-34	B 3.3-54	B 3.4-6	B 3.5-6	B 3.7-31	B 3.8-18	B 3.8-71
	B 3.1-35	B 3.3-98	B 3.4-9	B 3.5-7	B 3.7-35	B 3.8-19	B 3.8-75
	B 3.1-45	B 3.3-99	B 3.4-15	B 3.5-16	B 3.7-39	B 3.8-20	B 3.8-81
	B 3.1-46	B 3.3-100	B 3.4-18	B 3.5-17	B 3.7-43	B 3.8-21	B 3.8-87
	B 3.2-9	B 3.3-101	B 3.4-23	B 3.5-18	B 3.7-44	B 3.8-22	B 3.9-4
	B 3.2-11	B 3.3-102	B 3.4-27	B 3.5-26	B 3.7-47	B 3.8-23	B 3.9-7
	B 3.2-19	B 3.3-103	B 3.4-31	B 3.5-27	B 3.7-54	B 3.8-24	B 3.9-10
	B 3.2-22	B 3.3-104	B 3.4-32	B 3.5-30	B 3.7-55	B 3.8-25	B 3.9-11
	B 3.2-28	B 3.3-121	B 3.4-35	B 3.6-10	B 3.7-60	B 3.8-26	B 3.9-16
	B 3.2-29	B 3.3-122	B 3.4-39	B 3.6-22	B 3.7-65	B 3.8-27	B 3.9-17
	B 3.3-43	B 3.3-127	B 3.4-49	B 3.6-24	B 3.7-66	B 3.8-28	B 3.9-21
	B 3.3-45	B 3.3-128	B 3.4-60	B 3.6-25	B 3.7-71	B 3.8-41	B 3.9-24
	B 3.3-46	B 3.3-135	B 3.4-61	B 3.6-29	B 3.7-77	B 3.8-43	B 3.9-26
	B 3.3-47	B 3.3-136	B 3.4-62	B 3.6-32	B 3.7-83	B 3.8-44	
	B 3.3-48	B 3.3-142	B 3.4-67	B 3.6-37	B 3.7-86	B 3.8-51	

BASES INSERT

INSERT 3

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

ACTIONS

A.1 (continued)

possible, the borated water source should be a highly concentrated solution, such as that normally found in the boric acid storage tank, or the refueling water storage tank. The operator should borate with the best source available for the plant conditions.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

In MODES 2 (with $k_{eff} < 1.0$), 3, 4 and 5, the SDM is verified by performing a reactivity balance calculation, considering the listed reactivity effects:

a. RCS boron concentration;

b. Shutdown and Control bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

Using the ITC accounts for Doppler reactivity in this calculation because the reactor is subcritical, and the fuel temperature will be changing at the same rate as the RCS.

In the event that a rod is known to be untrippable, however, SDM verification must account for the worth of the untrippable rod as well as another rod of maximum worth.

INSERT 3

~~The Frequency of 24 hours is based on the generally slow change in required boron concentration and the low probability of an accident occurring without the required SDM. This allows time for the operator to collect the required data, which includes performing a boron concentration analysis, and complete the calculation.~~

(continued)

BASES

ACTIONS

B.1 (continued)

this status, the plant must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then the boration required by LCO 3.1.1 Required Action A.1 would occur. The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made, considering that other core conditions are fixed or stable, including control rod position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 as an initial check on core conditions and design calculations at BOC. The SR is modified by a Note. The Note requires that the normalization of predicted core reactivity to the measured value must take place within the first 60 effective full power days (EFPD) after each fuel loading. However, if the deviation between measured and predicted values is within the associated measurement and analytical uncertainties, it is not necessary to normalize the predicted core reactivity. This allows sufficient time for core conditions to reach steady state, but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. The required subsequent Frequency ~~of 31 EFPD~~, following the initial 60 EFPD after entering MODE 1, ~~is acceptable, based on the slow rate of core changes due to fuel depletion and the presence of other indicators (QPTR, AFD, etc.) for prompt indication of an anomaly.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26, GDC 28, and GDC 29.
2. FSAR, Chapter 15.

is controlled under the Surveillance Frequency Control Program.

BASES

ACTIONS (continued)

D.2

If more than one rod is found to be misaligned or becomes misaligned because of bank movement, the unit conditions fall outside of the accident analysis assumptions. Since automatic bank sequencing would continue to cause misalignment, the unit must be brought to a MODE or Condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours.

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

~~Verification that individual rod positions are within alignment limits at a Frequency of 12 hours provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. If the rod position deviation monitor is inoperable, the Frequency is increased to 4 hours per TRM requirement TRS 13.1.37.1 which accomplishes the same goal. The specified Frequency takes into account other rod position information that is continuously available to the operator in the control room, so that during actual rod motion, deviations can immediately be detected.~~

SR 3.1.4.2

INSERT 3

Verifying each control rod is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each control rod would result in radial or axial power tilts, or oscillations. Exercising each individual control rod ~~every 92 days~~ provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each control rod by 10 steps will not cause radial or axial power tilts, or oscillations, to occur. The ~~92 day~~ Frequency takes into consideration other information available to the operator in the control room and SR 3.1.4.1, which is performed more frequently and adds to the determination of OPERABILITY of the rods. Between or during required performances of SR 3.1.4.2 (determination of control rod OPERABILITY by movement), if a control rod(s) is discovered to be immovable, but remains trippable, the control rod(s) is considered to be OPERABLE until the surveillance interval expires. At any time, if a control rod(s) is immovable, a determination of the trippability (OPERABILITY) of the control rod(s) must be made, and appropriate action taken.

(continued)

BASES

ACTIONS

A.1.1, A.1.2 and A.2 (continued)

The allowed Completion Time of 2 hours provides an acceptable time for evaluating and repairing minor problems without allowing the plant to remain in an unacceptable condition for an extended period of time.

B.1

If the shutdown banks cannot be restored to within their insertion limits within 2 hours, the unit must be brought to MODE 3 where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that the shutdown banks are within their insertion limits prior to an approach to criticality ensures that when the reactor is critical, or being taken critical, the shutdown banks will be available to shut down the reactor, and the required SDM will be maintained following a reactor trip. This SR and Frequency ensure that the shutdown banks are within limits during a unit startup and subsequent operation.

INSERT 3

~~Since the shutdown banks are positioned manually by the control room operator, a verification of shutdown bank position at a Frequency of 12 hours is adequate to ensure that they are within their insertion limits. Also, the 12 hour Frequency takes into account other information available in the control room for the purpose of monitoring the status of shutdown rods.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10, GDC 26, and GDC 28.
2. 10 CFR 50.46.
3. FSAR, Chapter 15.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

This Surveillance is required to ensure that the reactor does not achieve criticality with the control banks below their insertion limits.

The estimated critical condition (ECC) depends upon a number of factors, one of which is xenon concentration. If the ECC was calculated long before criticality, xenon concentration could change to make the ECC substantially in error. Conversely, determining the ECP immediately before criticality could be an unnecessary burden. There are a number of unit parameters requiring operator attention at that point. Performing the ECC calculation within 4 hours prior to criticality avoids a large error from changes in xenon concentration, but allows the operator some flexibility to schedule the ECC calculation with other startup activities.

SR 3.1.6.2

Verification of the control bank insertion limits at a Frequency of ~~12 hours is~~ sufficient to ensure OPERABILITY and to ~~detect control~~ banks that may be approaching the insertion ~~limits since~~, normally, very little rod motion occurs in ~~12 hours.~~

INSERT 3

SR 3.1.6.3

There is a potential that, with only a limit on rod insertion, the RCCAs could be placed in a sequence or overlap position, perhaps during troubleshooting activities or other abnormal plant conditions, that would violate core flux peaking factors while still satisfying the limits on rod insertion. This scenario is most likely to occur at reduced power following an automatic runback or due to an administrative power reduction in response to some rod control abnormality.

This surveillance ensures that the rod configuration across the core for any given operating condition will not result in unanalyzed peaking factors. The surveillance is not designed to test or verify the function of the Rod Control sequence and overlap circuits. In practice, this surveillance will be satisfied as long as the rod positions are in the positions specified in the COLR, regardless of the operability of the sequence and overlap circuits. The intent is to check the rod position to verify that the rods are in the expected positions as described in the COLR. If all rods are out of the core when the check is made, then rod sequence and overlap limits are satisfied for the purpose of this surveillance. At all power levels, the rod positions should conform to the requirements of the COLR for rod sequence and overlap. Implicit within the LCO is the assumption that bank sequence and overlap

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.1.6.3 (continued) must be maintained during rod movement. When control banks are maintained within their insertion limits as checked by SR 3.1.6.2 above, it is unlikely that their sequence and overlap will not be in accordance with requirements provided in the COLR. ~~A Frequency of 12 hours is consistent with the insertion limit check above in SR 3.1.6.2.~~
REFERENCES	1. 10 CFR 50, Appendix A, GDC 10, GDC 26, GDC 28. 2. 10 CFR 50.46. 3. FSAR, Chapter 15.

INSERT 3

BASES

ACTIONS (continued)

B.1

When THERMAL POWER is > 5% RTP, the only acceptable action is to open the reactor trip breakers (RTBs) to prevent operation of the reactor beyond its design limits. Immediately opening the RTBs will shut down the reactor and prevent operation of the reactor outside of its design limits.

C.1

When the RCS lowest operating loop T_{avg} is < 541°F, the appropriate action is to restore T_{avg} to within its specified limit. The allowed Completion Time of 15 minutes provides time for restoring T_{avg} to within limits without allowing the plant to remain in an unacceptable condition for an extended period of time. Operation with the reactor critical and with temperature below 541°F could violate the assumptions for accidents analyzed in the safety analyses.

D.1

If the Required Actions cannot be completed within the associated Completion Time, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within an additional 15 minutes. The Completion Time of 15 additional minutes is reasonable, based on operating experience, for reaching MODE 3 in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

The power range and intermediate range neutron detectors must be verified to be OPERABLE in MODE 2 by LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." A CHANNEL OPERATIONAL TEST is performed on each power range and intermediate range channel prior to initiation of the PHYSICS TESTS. This will ensure that the RTS is properly aligned to provide the required degree of core protection during the performance of the PHYSICS TESTS.

SR 3.1.8.2

Verification that the RCS lowest operating loop T_{avg} is ≥ 541°F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. ~~Verification of the RCS temperature at a Frequency of 30 minutes~~

INSERT 3

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.2 (continued)

~~during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.~~

SR 3.1.8.3

Verification that the THERMAL POWER is ≤ 5% RTP will ensure that the plant is not operating in a condition that could invalidate the safety analyses. Verification of the THERMAL POWER at a Frequency of 1 ~~hour during the~~ performance of the PHYSICS TESTS ~~will ensure~~ that the initial conditions of the safety ~~analyses are~~ not violated.

INSERT 3

SR 3.1.8.4

Verification that the SDM is within limits specified in the COLR ensures that, for the specific RCCA and RCS temperature manipulations performed during PHYSICS TESTS, the plant is not operating in a condition that could invalidate the safety analysis assumptions. The SDM verification can be facilitated through the use of tables prepared by the core designers in which the reactivity effects expected during the Physics Testing have been previously considered.

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration;

b. Shutdown and Control bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

Using the ITC accounts for Doppler reactivity in this calculation because the reactor is subcritical, and the fuel temperature will be changing at the same rate as the RCS.

The Frequency of 24 hours is based on the generally ~~slow change in~~ required boron concentration ~~and on the low~~ probability of an accident ~~occurring without~~ the required SDM.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1 (continued)

The limit with which $F_Q^C(Z)$ is compared varies inversely with power above 50% RTP and directly with a function called K(Z) provided in the COLR.

Performing this Surveillance in MODE 1 prior to exceeding 75% RTP, provides assurance that the $F_Q^C(Z)$ limit is met when RTP is achieved, because peaking factors generally decrease as power level is increased.

If THERMAL POWER has been increased by ≥ 20% RTP since the last determination of $F_Q^C(Z)$, another evaluation of this factor is required 24 hours after achieving equilibrium conditions at this higher power level (to ensure that $F_Q^C(Z)$ values are being reduced sufficiently with power increase to stay within the LCO limits).

INSERT 3

~~The Frequency of 31 EFPD is adequate to monitor the change of power distribution with core burnup because such changes are slow and well controlled when the plant is operated in accordance with the Technical Specifications (TS).~~

SR 3.2.1.2

The nuclear design process includes calculations performed to determine that the core can be operated within the $F_Q(Z)$ limits. Because power distribution measurements are taken at or near equilibrium conditions, the variations in power distribution resulting from normal operational maneuvers are not present in the core power distribution measurement data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation. The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor, $F_Q^C(Z)$, by W(Z) gives the maximum $F_Q(Z)$ calculated to occur in normal operation, $F_Q^W(Z)$.

The limit with which $F_Q^W(Z)$ is compared varies inversely with power above 50% RTP and directly with the function K(Z) provided in the COLR.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.2 (continued)

INSERT 3

~~The Surveillance Frequency of 31 EFPD is adequate to monitor the change of power distribution with core burnup. The Surveillance may be done more frequently if required by the results of $F_Q(Z)$ evaluations.~~

~~The Frequency of 31 EFPD is adequate to monitor the change of power distribution because such a change is sufficiently slow, when the plant is operated in accordance with the TS, to preclude adverse peaking factors between 31 day surveillances.~~

REFERENCES

1. 10 CFR 50.46, 1974.
2. Regulatory Guide 1.77, Rev. 0, May 1974.
3. 10 CFR 50, Appendix A, GDC 26.
4. RXE-90-006-P-A, "Power Distribution Control Analysis and Overtemperature N-16 and Overpower N-16 Trip Setpoint Methodology," TU Electric, June 1994.
5. WCAP-7308-L-P-A, "Evaluation of Nuclear Hot Channel Factor Uncertainties," June 1988.
6. WCAP-10216-P-A, Rev. 1A, "Relaxation of Constant Axial Offset Control (and) FQ Surveillance Technical Specification," February 1994.
7. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1 (continued)

INSERT 3

The 31 EFPD Frequency is acceptable because the power distribution changes relatively slowly over this amount of fuel burnup. Accordingly, this Frequency is short enough that the $F^{N}_{\Delta H}$ limit cannot be exceeded for any significant period of operation.

REFERENCES

1. Regulatory Guide 1.77, Rev. 0, May 1974.
2. 10 CFR 50, Appendix A, GDC 26.
3. 10 CFR 50.46.
4. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

LCO (continued)

detector well. For convenience, this flux difference is converted to provide flux difference units expressed as a percentage and labeled as %Δ flux or %ΔI.

The AFD limits are provided in the COLR. The AFD limits for RAOC do not depend on the target flux difference. However, the target flux difference may be used to minimize changes in the axial power distribution.

Violating the LCO on the AFD could produce unacceptable consequences if a Condition 2, 3, or 4 event occurs while the AFD is outside its limits.

APPLICABILITY

The AFD requirements are applicable in MODE 1 greater than or equal to 50% RTP, when the combination of THERMAL POWER and core peaking factors are the core parameters of primary importance in safety analyses (Ref. 1).

For AFD limits developed using RAOC methodology, the value of the AFD does not affect the limiting accident consequences with THERMAL POWER < 50% RTP and for lower operating power MODES.

ACTIONS

A.1

As an alternative to restoring the AFD to within its specified limits, Required Action A.1 requires a THERMAL POWER reduction to < 50% RTP. This places the core in a condition for which the value of the AFD is not important in the applicable safety analyses. A Completion Time of 30 minutes is reasonable, based on operating experience, to reach 50% RTP without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

INSERT 3

This Surveillance verifies that the AFD as indicated by the NIS excore channels is within its specified limits. ~~The Surveillance Frequency of 7 days is adequate because the AFD is controlled by the operator and monitored by the process computer. Furthermore, any deviations of the AFD from requirements that is not alarmed should be readily noticed.~~

(continued)

BASES

ACTIONS

A.6 (continued)

RTP within 24 hours but is increased slowly, then the peaking factor surveillances must be performed within 48 hours after increasing THERMAL POWER above the limit of Required Action A.1. This Completion Time is intended to allow adequate time to increase THERMAL POWER to above the limits of Required Action A.1, while not permitting the core to remain with unconfirmed power distributions for extended periods of time.

Required Action A.6 is modified by a Note that states that the peaking factor surveillances must be completed when the excore detectors have been normalized to restore QPTR to within limit (i.e., Required Action A.5). The intent of this Note is to have the peaking factor surveillances performed at operating power levels, which can only be accomplished after the excore detectors are normalized to restore QPTR to within limit.

B.1

If Required Actions A.1 through A.6 are not completed within their associated Completion Times, the unit must be brought to a MODE or condition in which the requirements do not apply. To achieve this status, THERMAL POWER must be reduced to < 50% RTP within 4 hours. The allowed Completion Time of 4 hours is reasonable, based on operating experience regarding the amount of time required to reach the reduced power level without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1

SR 3.2.4.1 is modified by two Notes. Note 1 allows QPTR to be calculated with three power range channels if THERMAL POWER is ≤ 75% RTP and the input from one Power Range Neutron Flux channel is inoperable. Note 2 allows performance of SR 3.2.4.2 in lieu of SR 3.2.4.1

INSERT 3

This Surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) excore channels, is within its limits. ~~The Frequency of 7 days takes into account other information and alarms available to the operator in the control room.~~

For those causes of QPT that occur quickly (e.g., a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.4.2

This Surveillance is modified by a Note, which states that it is not required until 12 hours after the inputs from one or more Power Range Neutron Flux channels are inoperable and the THERMAL POWER is > 75% RTP.

With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. ~~Performing SR 3.2.4.2 at a Frequency of 12 hours provides an accurate alternative means for ensuring that any tilt remains within its limits.~~ INSERT 3

For purposes of monitoring the QPTR when one power range channel is inoperable, the moveable incore detectors or an OPERABLE PDMS may be used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. When using the moveable incore detector system, the incore detector monitoring is performed with a full incore flux map or two sets of four thimble locations with quarter core symmetry. The two sets of four symmetric thimbles is a set of eight unique detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, and N-8.

The symmetric thimble flux map can be used to generate symmetric thimble "tilt." This can be compared to a reference symmetric thimble tilt, from the most recent full core flux map, to generate an incore QPTR. Therefore, incore monitoring of QPTR can be used to confirm that QPTR is within limits.

With one NIS channel inoperable, the indicated tilt may be changed from the value indicated with all four channels OPERABLE. To confirm that no change in tilt has actually occurred, which might cause the QPTR limit to be exceeded, the incore result may be compared against previous core power distribution measurements using an OPERABLE PDMS and the symmetric thimbles as described above or a complete flux map. Nominally, quadrant tilt from the Surveillance should be within 2% of the tilt shown by the most recent flux map data.

REFERENCES

1. 10 CFR 50.46.
2. Regulatory Guide 1.77, Rev 0, May 1974.
3. 10 CFR 50, Appendix A, GDC 26.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The SRs for each RTS Function are identified by the SRs column of Table 3.3.1-1 for that Function.

A Note has been added to the SR Table stating that Table 3.3.1-1 determines which SRs apply to which RTS Functions.

Note that each channel of process protection supplies both trains of the RTS. When testing Channel I, Train A and Train B must be examined. Similarly, Train A and Train B must be examined when testing Channel II, Channel III, and Channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.1.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that 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 two 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 that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit 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 sensor or the signal processing equipment has drifted outside its limit.

INSERT 3

~~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 LCO required channels.~~

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the NIS and N-16 power indications ~~every 24 hours~~. If the calorimetric exceeds the NIS or N-16 power indications by more than +2% RTP, the affected NIS and N-16 functions are not declared inoperable, but the channel gains must be adjusted consistent with the calorimetric power. If the NIS or N-16 channel outputs cannot be properly adjusted, the channel is declared inoperable.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2 (continued)

feedwater venturi. While the measurement uncertainty remains constant in ΔP as power decreases, when translated into flow, the uncertainty increases as a square term. Thus, a 1% flow error at 100% power can approach a 10% flow error at 30% RTP event though the ΔP error has not changed.

An evaluation of extended operations at reduced power conditions would likely conclude that it is prudent to administratively adjust the setpoint of the Power Range Neutron Flux - High bistables to ≤ 90% RTP when: 1) the Power Range channel output is adjusted in the decreasing power direction due to a reduced power venturi-based calorimetric below 55% RTP; or 2) for a post refueling startup (consistent with the Bases for SR 3.4.1.4). The evaluation of extended operation at reduced power conditions would also likely conclude that the potential need to adjust the indication of the Power Range Neutron Flux in the decreasing power direction is quite small, primarily to address operation in the intermediate range about P-10 (nominally 10% RTP) to allow enabling of the Power Range Neutron Flux - Low setpoint and the Intermediate Range Neutron Flux reactor trips. Before the Power Range Neutron Flux - High bistables are reset to their nominal value high setpoint, the NIS or N-16 power indication adjustment must be confirmed based on LEFM-based calorimetric or on a venturi-based calorimetric performed at ≥ 55% RTP.

The Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours are allowed for performing the first Surveillance after reaching 15% RTP. A power level of 15% RTP is chosen based on plant stability; i.e., the turbine generator is synchronized to the grid and rod control is in the automatic mode. The 24-hour allowance after increasing THERMAL POWER above 15% RTP provides a reasonable time to attain a scheduled power plateau, establish the requisite conditions, perform the required calorimetric measurement and make any required adjustments in a controlled, orderly manner and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be acceptable for subsequent use.

INSERT 3

The Frequency of every 24 hours is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate that a difference of more than +2% RTP between the calorimetric heat balance calculation and NIS Power Range channel output or N-16 Power Monitor output is not expected in any 24 hour period.

In addition, control room operators periodically monitor redundant indications and alarms to detect deviations in channel outputs.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output ~~every 31 EFPD.~~ If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. The excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%.

If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This Surveillance is performed to verify the f(Δq) input to the overtemperature N-16 Function.

A Note clarifies that the Surveillance is required only if reactor power is ≥ 50% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 50% RTP. The Note allows power ascensions and associated testing to be conducted in a controlled and orderly manner, at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be OPERABLE. Due to such effects as shadowing from the relatively deep control rod insertion and, to a lesser extent, the dependency of the axially-dependent radial leakage on the power level, the relationship between the incore and excore indications of axial flux difference (AFD) at lower power levels is variable. Thus, it is acceptable to defer the calibration of the excore AFD against the incore AFD until more stable conditions are attained (i.e, withdrawn control rods and a higher power level). The AFD is used as an input to the Overtemperature N-16 reactor trip function and for assessing compliance with LCO 3.2.3, "Axial Flux Difference." Due to the DNB benefits gained by administratively restricting the power level to 50% RTP, no limits on AFD are imposed below 50% RTP by LCO 3.2.3; thus, the proposed change is consistent with the LCO 3.2.3 requirements below 50% RTP. Similarly, sufficient DNB margins are realized through operation below 50% RTP that the intended function of the Overtemperature N-16 reactor trip function is maintained, even though the excore AFD indication may not exactly match the incore AFD indication. Based on plant operating experience, 24 hours is a reasonable time frame to limit operation above 50% RTP while completing the procedural steps associated with the surveillance in an orderly manner.

INSERT 3

The Frequency of every 31 EFPD is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Also, the slow changes in neutron flux during the fuel cycle can be detected during this interval.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT ~~every 62 days on a STAGGERED TEST BASIS.~~ This test shall verify OPERABILITY by actuation of the end devices. The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test shall include a local manual shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

~~The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 12.~~

INSERT 3

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested ~~every 92 days on a STAGGERED TEST BASIS,~~ using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. ~~The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 12.~~

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the core power distribution measurement. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the core power distribution measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(Δq) input to the overtemperature N-16 Function.

A Note modifies SR 3.3.1.6. The Note states that this Surveillance is required only if reactor power is ≥ 75% RTP and that 72 hours is allowed for performing the first surveillance after reaching equilibrium conditions at a THERMAL POWER ≥ 75% RTP. The SR is deferred until a scheduled testing plateau above 75% is attained during the post-outage power ascension. During a typical post-refueling power ascension, it is usually necessary to control the axial flux difference at lower power levels through control rod insertion. Due to rod shadowing effects and, to a lesser degree,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.6 (continued)

the dependency of the axially-dependent radial leakage on the power level, the incore-excore AFD relationship well below 75% RTP may differ excessively from the incore-excore axial flux difference relationship at full power. Excore calibration adjustments should be based on the incore-excore multipoint relationship established above 75% RTP by use of the developed calibration standard equations or by initiating an AFW swing and performing a direct multipoint measurement. After equilibrium conditions are achieved at the specified power plateau, a full core flux map must be taken, and the required data collected. The data is typically analyzed and the appropriate excore calibrations are completed within 48 hours after achieving equilibrium conditions. An additional time allowance of 24 hours is provided during which the effects of equipment failures may be remedied and any required re-testing may be performed.

The allowance of 72 hours after equilibrium conditions are attained at the testing plateau provides sufficient time to allow power ascensions and associated testing to be conducted in a controlled and orderly manner, at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be acceptable for subsequent use. The benefit gained by operating at reduced power levels is sufficient to offset potential differences between the incore and excore indications of Δq prior to completion of this surveillance.

INSERT 3

~~The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.~~

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT ~~every 184 days~~. A COT is performed on each required channel to ensure the channel will perform the intended Function.

Setpoints must be within the Allowable Values specified in Table 3.3.1-1.

SR 3.3.1.7 is modified by two Notes. Note 1 provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3. Note 2 requires that the quarterly COT for the source range instrumentation include verification by observation of the associated permissive annunciator

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

window that the P-6 and P-10 interlocks are in their required state for the existing unit conditions.

SR 3.3.1.7 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.1-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

INSERT 3

~~The Frequency of 184 days is justified in Reference 12.~~

the Frequency specified in the Surveillance Frequency Control Program

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, and it is modified by the same Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit conditions. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed e.g., by observation of the associated permissive annunciator window, within ~~184 days of the Frequencies~~ prior to reactor startup, up to 12 hours after reducing power below P-10, and four hours after reducing power below P-6, as discussed below. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "12 hours after reducing power

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.8 (continued)

below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency ~~of every 184 days~~ thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup, 12 hours after reducing power below P-10, and four hours after reducing power below P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 for more than 12 hours or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 12 hour or 4 hour limit, as applicable. These time limits are reasonable, based on operating experience, to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for the periods discussed above. ~~The Frequency of 184 days is justified in Reference 12.~~

INSERT 3

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT ~~and is performed every 92 days, as justified in Reference 5.~~

This SR is modified by a Note that excludes verification of setpoints from the TADOT. Since this SR applies to RCP undervoltage and underfrequency relays, setpoint verification requires elaborate bench calibration and is accomplished during the CHANNEL CALIBRATION.

SR 3.3.1.10

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

This SR is modified by Note 1 stating that N-16 detectors are excluded from the CHANNEL CALIBRATION because the unit must be in at least MODE 1 to obtain N-16 indications. However, after achieving equilibrium conditions

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.10 (continued)

in MODE 1, detector plateau curves should be obtained, evaluated and compared to manufacturer's data.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint methodology.

INSERT 3

~~The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.~~

SR 3.3.1.10 is modified by Note 2 stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable. This surveillance does not include verification of time delay relays. These relays are verified via response time testing per SR 3.3.1.16. Whenever an RTD is replaced in Functions 6 or 7, the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares other sensing elements with the recently installed element.

The SR is modified by Note 3 stating that, prior to entry into MODES 2 or 1, power and intermediate range detector plateau verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP.

SR 3.3.1.10 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.1-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note (r) requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.10 (continued)

cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10~~, every 18 months~~. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. For the intermediate and power range channels, detector plateau curves are obtained, evaluated and compared to manufacturer's data. For the source range neutron detectors, performance data is obtained and evaluated. Note 3 states that, prior to entry into MODES 2 or 1, the power and intermediate range detector plateau voltage verification is not required to be current until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP. Equilibrium conditions are achieved when the core is sufficiently stable at intended operating conditions to perform a meaningful detector plateau voltage verification. The allowance of 72 hours after equilibrium conditions are attained at the testing plateau provides sufficient time to allow power ascension testing to be conducted in a controlled and orderly manner at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be OPERABLE for subsequent use. ~~Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.~~

INSERT 3

SR 3.3.1.11 is modified by Note 2 stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable. This surveillance does not include verification of time delay relays. These relays are verified via response time testing per SR 3.3.1.16.

SR 3.3.1.12

Not Used.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks ~~every 18 months~~.

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.13 (continued)

INSERT 3

The Frequency is based on the known reliability of the ~~interlocks and~~ the multichannel redundancy available~~, and has~~ been shown to be acceptable through ~~operating~~ experience.

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, and the SI Input from ESFAS, and the Reactor Trip Bypass Breaker undervoltage trip mechanisms. ~~This TADOT is performed every 18 months.~~

The Manual Reactor Trip TADOT shall independently verify the OPERABILITY of the handswitch undervoltage and shunt trip contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip mechanism.

The Frequency is based on the known reliability of the ~~Functions and~~ the multichannel redundancy available~~, and has~~ been shown to be acceptable through ~~operating~~ experience.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. This TADOT is as described in SR 3.3.1.4, except that this test is performed prior to exceeding the P-9 interlock whenever the unit has been in MODE 3. This Surveillance is not required if it has been performed within the previous frequency specified in the SFCP ~~31 days~~. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock.

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. The required trip initiation signals and acceptance criteria for response time testing are included in Technical Requirements Manual, (Ref. 6). No credit was taken in the safety analyses for those channels with response time listed as N.A. No response time testing requirements apply where N.A. is listed in the TRM. Individual component response times are not modeled in the analyses. The analyses model the overall or total

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor until loss of stationary gripper coil voltage.

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function time constants set at their nominal values.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

INSERT 3

~~As appropriate, each channel's response time must be verified every 18 months on a STAGGERED TEST BASIS. Each verification shall include at least one logic train such that both logic trains are verified at least once per 36 months. Testing of the final actuation devices is included in the testing. Some portions of the response time testing cannot be performed during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~
Response time verification in lieu of actual testing may be performed on RTS components in accordance with reference 10.

SR 3.3.1.16 is modified by a Note stating that neutron and N-16 gamma detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. Response time of the neutron flux or N-16 signal portion of the channel shall be measured from detector output or input to the first electronic component in the channel. SR 3.3.1.16 is applied to Power Neutron Flux Rate - High Positive Rate based on NSAL 09-01 [Ref. 14] in accordance with Administrative Letter 98-10.

REFERENCES

1. FSAR, Chapter 7.

2. FSAR, Chapter 15.

(continued)

BASES

ACTIONS

L.1, L.2.1 and L.2.2 (continued)

With one or more required channel(s) inoperable, the operator must verify that the interlock is in the required state for the existing unit condition by observation of the permissive annunciator windows. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 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. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks.

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS Function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV. The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.2.1

Performance of the CHANNEL CHECK ~~once every 12 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 two 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1 (continued)

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and reliability. 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 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 LCO required channels.~~

INSERT 3

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST. ~~The SSPS is tested every 92 days on a STAGGERED TEST BASIS,~~ using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. ~~The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 13.~~

SR 3.3.2.3

Not used.

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. ~~This test is performed every 92 days on a STAGGERED TEST BASIS.~~ The time allowed for the testing (4 hours) is justified in Reference 6. ~~The Frequency of 92 days on a STAGGERED TEST BASIS is justified in Reference 13.~~

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.2.5 (continued)

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint calculation. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint calculation.

SR 3.3.2.5 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.2-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

INSERT 3 ~~The Frequency of 184 days is justified in Reference 13.~~

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function, or is placed in a

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.6 (continued)

condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing contacts operated by the slave relay. ~~This test is performed every 92 days. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data~~.

For ESFAS slave relays and auxiliary relays which are Westinghouse type AR relays, ~~the SLAVE RELAY TEST is performed every 18 months. The Frequency is based on~~ the slave relay reliability assessment presented in Reference 10~~. This reliability assessment~~ is relay specific and applies only to Westinghouse type AR relays with AC coils. Note that, for normally energized applications, the relays may require periodic replacement in accordance with the guidance given in Reference 10.

SR 3.3.2.7

SR 3.3.2.7 is the performance of a TADOT ~~every 31 days~~. This test is a check of the Loss of Offsite Power Function.

INSERT 3

The SR is modified by a Note that excludes verification of setpoints for relays. Relay setpoints require elaborate bench calibration and are verified during CHANNEL CALIBRATION. The SR is modified by a second note that excludes the actuation of final devices from the surveillance testing. The start of the auxiliary feedwater pumps during this SR is unnecessary as these pumps are adequately tested by the SRs for LCO 3.7.5. ~~The Frequency is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.~~

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and AFW pump start on trip of all MFW pumps. The Safety Injection TADOT shall independently verify the OPERABILITY of the handswitch undervoltage and shunt trip contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers as well as the contacts for safety injection actuation. ~~It is performed every 18 months~~. As a minimum, each Manual Actuation Function is tested up to, but not including, the master relay coils. This test overlaps with the master relay coil testing performed in accordance with SR 3.3.2.4. ~~The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle.~~ The

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.2.8 (continued)

SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A ~~CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology.

INSERT 3

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.9 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.2-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note (r) requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.9 (continued)

Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing, required channels, and acceptance criteria are included in the Technical Requirements Manual (Ref. 7). For each Functional Unit to which this SR applies, at least one ESF function has a required response time but not necessarily all associated ESF functions. No credit was taken in the safety analyses for those channels with response time listed as N.A. When the response time for a function in the TRM is NA, no specific testing need be performed to comply with this SR. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time testing may be performed with the transfer functions set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

ESF RESPONSE TIME tests are performed on an 18 month STAGGERED TEST BASIS. The testing shall include at least one train such that both trains are tested at least once per 36 months. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. The final actuation device in one train is tested with

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.10 (continued)

each channel. Therefore, staggered testing results in response time verification of these devices every 18 months. The ~~18 month~~ Frequency is consistent with the typical refueling ~~cycle and~~ is based on unit operating experience, which ~~shows that~~ random failures of instrumentation ~~components~~ causing serious response time degradation, but not channel ~~failure, are infrequent occurrences.~~ Response time verification in lieu of actual testing may be performed on ESFAS components in accordance with reference 11.

This ~~SR~~ is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 532 psig in the SGs.

INSERT 3

SR 3.3.2.11

SR 3.3.2.11 is the performance of a TADOT as described in SR 3.3.2.8, except that it is performed for the P-4 Reactor Trip Interlock. ~~This Frequency is based on operating experience.~~

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 7.
3. FSAR, Chapter 15.
4. IEEE-279-1971.
5. 10 CFR 50.49.
6. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
7. Technical Requirements Manual.
8. WCAP-10271-P-A, Supplement 3, September 1990.
9. "Westinghouse Setpoint Methodology for Protection Systems Comanche Peak Unit 1, Revision 1," WCAP-12123, Revision 2, April, 1989.
10. WCAP-13877-P-A, Revision 2, August 2000.

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

If the Required Action and associated Completion Time of Condition C is not met and Table 3.3.3-1 directs entry into Condition E, the unit must be brought to a MODE where the requirements of this LCO do not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and MODE 4 within 12 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.

F.1

Alternate means of monitoring Reactor Vessel Water Level and Containment Area Radiation have been developed. These alternate means may be temporarily used if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the unit but rather to follow the directions of Specification 5.6.8, in the Administrative Controls section of the TS. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that SR 3.3.3.1 and SR 3.3.3.3 apply to each PAM instrumentation Function in Table 3.3.3-1.

SR 3.3.3.1

Performance of the CHANNEL CHECK ~~once every 31 days~~ ensures that a gross instrumentation failure 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 two 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1 (continued)

Agreement criteria are determined by the unit 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. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

As specified in the SR, a CHANNEL CHECK is only required for those channels that are normally energized. All of the instruments listed in Table 3.3.3-1 are normally energized.

The Frequency of 31 days is based on operating experience that demonstrates that 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 LCO required channels.

INSERT 3

SR 3.3.3.2

Deleted

SR 3.3.3.3

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. The calibration method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." Whenever an RTD is replaced in Function 3 or 4, the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares other sensing elements with the recently installed element. Whenever a core exit thermocouple replaced in Functions 15 thru 18, the next required CHANNEL CALIBRATION of the core exit thermocouples is accomplished by an in-place cross calibration that compares the other sensing elements with the recently installed sensing element. ~~The Frequency is based on operating experience and consistency with the typical industry refueling cycle~~. Containment Radiation Level (High Range) CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/hr and a one point calibration check of the detector below 10R/hr with an installed or portable gamma source.

(continued)

BASES

ACTIONS

A.1 (continued)

The Required Action is to restore the required Function and required HSP controls to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

B.1 and B.2

If the Required Action and associated Completion Time of Condition A is not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 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 3.3.4.1

Performance of the CHANNEL CHECK ~~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 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 two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. 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.

As specified in the Surveillance, a CHANNEL CHECK is only required for those channels which are normally energized. With the exception of the charging pump to CVCS and RCP seals flow indication, all instruments listed in Table 3.3.4-1 are normally energized. The channels (recorders) for the RCS Hot Leg Temperature and RCS Cold Leg Temperature functions may be de-energized during non-use with capability to be energized to obtain the necessary reading. ~~The Frequency of 31 days is based upon operating experience which demonstrates that channel failure is rare.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1 (continued)

The CHANNEL CHECK supplements less formal, but ~~more frequent,~~ checks of channels during normal ~~operational use~~ of the displays associated with the ~~LCO required~~ channels.

INSERT 3

SR 3.3.4.2

SR 3.3.4.2 verifies each required Remote Shutdown System HSP power and control circuit and transfer switch performs the intended function. This verification is performed from the Hot Shutdown Panel and locally, as appropriate. Operation of the equipment from the remote shutdown 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 unit can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. ~~The 18 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. (However, this Surveillance is not required to be performed only during a unit outage.) Operating experience demonstrates that remote shutdown control channels usually pass the Surveillance test when performed at the 18 month Frequency.

SR 3.3.4.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an in-place cross calibration that compares the other sensing elements with the recently installed sensing element. ~~The Frequency of 18 months is based upon operating experience and consistency with the typical industry refueling cycle.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 3 and 19.
2. FSAR Section 7.4

BASES

ACTIONS (continued)

F.1

Condition F applies when one or more trains of Automatic Actuation Logic and Actuation Relay function are inoperable.

Required Action F.1 requires restoring the inoperable train(s) to OPERABLE status. The 1 hour completion Time allows time to repair failures and takes into account the low probability of an event requiring LOP DG start occurring during this interval.

G.1

Condition G applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Conditions A through F are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources - Operating," for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

SR 3.3.5.1 is the performance of an ACTUATION LOGIC TEST. The LOP DG Start Automatic Actuation Logic and Actuation Relays are tested prior to entering MODE 4 when in MODE 5 for greater than or equal to 72 hours and if not performed in the previous ~~92 days~~. The Function is tested prior to entering MODE 4 to assure that the associated diesel generator is not unnecessarily started by the testing. Such unnecessary starts could be adverse to the reliability of the diesel generator. The testing verifies that the logic is OPERABLE. The Frequency of the testing is adequate. The 72 hours assures that there is sufficient time during the shutdown to perform the testing. ~~The 92 days is based on industry operating experience, considering instrument reliability and operating history data.~~

Frequency specified in the SFCP

INSERT 3

SR 3.3.5.2

SR 3.3.5.2 is the performance of a TADOT. This test is performed prior to entry into MODE 4 when in MODE 5 for ≥ 72 hours and if not performed in previous ~~92 days~~. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. ~~The Frequency is~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2 (continued)

~~based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~

SR 3.3.5.3

SR 3.3.5.3 is the performance of a CHANNEL CALIBRATION.

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

~~The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

INSERT 3

SR 3.3.5.4

SR 3.3.5.4 is the performance of the required response time verification (see also SR 3.3.2.10) ~~every 18 months on a STAGGERED TEST BASIS~~ on those functions with time limits provided in the Technical Requirements Manual. ~~Each verification shall include at least one train such that both trains are verified at least once per 36 months.~~

REFERENCES

1. FSAR, Section 8.3.
2. FSAR, Chapter 15.

BASES

ACTIONS (continued)

B.1 (continued)

If a train is inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action for the applicable Conditions of LCO 3.6.3 is met for each valve made inoperable by failure of isolation instrumentation.

A Note is added to allow the containment pressure relief valves to be opened in compliance with the gaseous effluent monitoring instrumentation requirements in Part I of the ODCM, for Required Action and associated Completion Time of Condition A not met.

A Note is added stating that Condition B is only applicable in MODE 1, 2, 3, or 4.

C.1 and C.2

Condition C applies to the inability to restore the radiation monitoring channel to OPERABLE status in the time allowed for Required Action A.1. If the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action to place and maintain containment ventilation isolation valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. A note allows the containment pressure relief valves to be opened in compliance with gaseous effluent monitoring instrumentation requirements in Part I of the ODCM. The Completion Time for these Required Actions is Immediately.

A Note states that Condition C is applicable during CORE ALTERATIONS and during movement of irradiated fuel assemblies within containment.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Ventilation Isolation Functions.

SR 3.3.6.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1 (continued)

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 LCO required channels.

INSERT 3

SR 3.3.6.2

SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. ~~This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 4.~~

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. ~~This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 4.~~

SR 3.3.6.4

A COT is performed ~~every 92 days~~ on each required channel to ensure the entire channel will perform the intended Function. ~~The Frequency is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 2).~~ This test verifies the capability of the instrumentation to provide the containment purge and exhaust system isolation. The setpoint shall be left consistent with the current calibration procedure tolerance.

SR 3.3.6.5

SR 3.3.6.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.5 (continued)

verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing contacts operated by the slave relay. ~~This test is performed every 92 days. The Frequency is acceptable based on instrument reliability and industry operating experience.~~

INSERT 3

For ESFAS slave relays and auxiliary relays which are Westinghouse type AR relays, the SLAVE RELAY TEST ~~is performed every 18 months. The Frequency is~~ based on the slave relay reliability assessment presented in Reference 3. This reliability assessment is relay specific and applies only to Westinghouse type AR relays with AC coils. Note that, for normally energized applications, the relays may require periodic replacement in accordance with the guidance given in Reference 3.

SR 3.3.6.6

Not Used.

SR 3.3.6.7

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

~~The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.~~

REFERENCES

1. 10 CFR 100.11.

2. NUREG-1366, July 22, 1993.

3. WCAP-13877-P-A, Revision 2, August 2000.

4. WCAP-15376-P-A, Revision 2, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," March 2003.

BASES

ACTIONS (continued)

D.1 and D.2

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met during MODE 5 or 6 or when irradiated fuel assemblies are being moved. Movement of irradiated fuel assemblies and CORE ALTERATIONS must be suspended immediately to reduce the risk of accidents that would require CREFS actuation

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1 determines which SRs apply to which CREFS Actuation Functions.

SR 3.3.7.1

Performance of the CHANNEL CHECK ~~once every 12 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 two 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 unit 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 sensor or the signal processing equipment has drifted outside its limit.

INSERT 3

~~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 LCO required channels.~~

SR 3.3.7.2

A COT is performed ~~once every 92 days~~ on each required channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the CREFS actuation. The setpoints shall be left consistent with the unit specific calibration procedure tolerance. ~~The Frequency is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.2 (continued)

~~experience~~. The COT surveillance of the control room air intake monitors verifies the contacts and circuitry between the monitors and the CREFS actuation circuits, and thereby satisfies the COT for Automatic Actuation Logic and Actuation Relays.

SR 3.3.7.3

Not Used.

SR 3.3.7.4

Not Used.

SR 3.3.7.5

Not Used.

SR 3.3.7.6

SR 3.3.7.6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions ~~and is performed every 18 months.~~ Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device.

INSERT 3

The test also includes trip devices that provide actuation signals directly to the Solid State Protection System, bypassing the analog process control equipment. ~~The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.~~ The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

SR 3.3.7.7

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

~~The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.~~

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the 12 hour Surveillance Frequency for pressurizer pressure is sufficient to ensure the pressure can be restored to a normal operation, steady state condition following load changes and other expected transient operations. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess for potential degradation and to verify operation is within safety analysis assumptions.

SR 3.4.1.2

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the 12 hour Surveillance Frequency for RCS average temperature is sufficient to ensure the temperature can be restored to a normal operation, steady state condition following load changes and other expected transient operations. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess for potential degradation and to verify operation is within safety analysis assumptions.

SR 3.4.1.3

INSERT 3

~~The 12 hour Surveillance Frequency for the indicated RCS total flow rate is performed using the installed flow instrumentation. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify operation within safety analysis assumptions.~~ The indication for this parameter indicates in percent (%). The value in % that will assure compliance with the minimum total flow limit in the SR is determined based on the measured RCS total flow from SR 3.4.1.4. ~~Following each refueling outage and~~ prior to the completion of SR 3.4.1.4, the value in % used to assure compliance with the minimum RCS total flow is based upon the measured RCS total flow (SR 3.4.1.4) from the previous operating cycle or an alternate measurement and assessment of actual RCS total flow.

SR 3.4.1.4

Measurement of RCS total flow rate by performance of a precision calorimetric heat balance ~~once every 18 months (after each refueling)~~ allows the installed RCS flow instrumentation to be normalized and verifies the actual RCS flow rate is greater than or equal to the minimum required RCS flow rate.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.4 (continued)

~~The Frequency of 18 months reflects the importance of verifying flow after a refueling outage when the core has been altered, which may have caused an alteration of flow resistance.~~

INSERT 3

This SR is modified by a Note that allows entry into MODE 1, without having performed the SR, and placement of the unit in the best condition for performing the SR. The Note states that the SR is not required to be performed until after exceeding 85% RTP after each refueling outage. Using precision instrumentation with multiple indications, the stated RCS flow accuracy may be attained at power levels significantly below 85% RTP, as described in the uncertainty analyses. Requiring the precision flow measurement to be performed prior to 85% RTP allows for a single testing plateau to be used to perform the RCS flow measurement and various other tests described in Section 3.2. Procedures require that the THERMAL POWER, available instrumentation, and calibration intervals be sufficient to ensure that the stated RCS flow accuracy is attained. For feedwater pressure and temperature, the main steam pressure, and feedwater flow differential pressure instruments are calibrated within 90 days of performing the calorimetric flow measurement.

REFERENCES

1. FSAR, Section 15.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1

RCS loop average temperature is required to be verified at or above 551°F ~~every 12 hours~~.

INSERT 3

~~The SR to verify operating RCS loop average temperatures every 12 hours takes into account indications and alarms that are continuously available to the operator in the control room and is consistent with other routine Surveillances which are typically performed once per shift. In addition, operators are trained to be sensitive to RCS temperature during approach to criticality and will ensure that the minimum temperature for criticality is met as criticality is approached.~~

REFERENCES

1. FSAR, Chapter 15.

BASES

ACTIONS

C.1 and C.2 (continued)

ASME Code, Section XI, Appendix E (Ref. 7), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

Condition C is modified by a Note requiring Required Action C.2 to 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 3.4.3.1

Verification that operation is within the PTLR 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 assessment and correction for minor deviations within a reasonable time.~~

INSERT 3

Surveillance for heatup, cooldown, or ISLH testing may be discontinued when the definition given in the relevant plant procedure for ending the activity is satisfied.

This SR is modified by a Note that only requires this SR to be performed during system heatup, cooldown, and ISLH testing. No SR is given for criticality operations because LCO 3.4.2 contains a more restrictive requirement.

REFERENCES

1. Not used.
2. 10 CFR 50, Appendix G.
3. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
4. ASTM E 185-82, July 1982.
5. 10 CFR 50, Appendix H.
6. Regulatory Guide 1.99, Revision 2, May 1988.
7. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

BASES

APPLICABILITY (continued)

The decay heat production rate is much lower than the full power heat rate. As such, the forced circulation flow and heat sink requirements are reduced for lower, noncritical MODES as indicated by the LCOs for MODES 3, 4, and 5.

Operation in other MODES is covered by:

LCO 3.4.5, "RCS Loops - MODE 3";
LCO 3.4.6, "RCS Loops - MODE 4";
LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled";
LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled";
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level" (MODE 6); and
LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level" (MODE 6).

ACTIONS

A.1

If the requirements of the LCO are not met, the Required Action is to reduce power and bring the plant to MODE 3. This lowers power level and thus reduces the core heat removal needs and minimizes the possibility of violating DNB limits.

The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

This SR requires verification ~~every 12 hours~~ that each RCS loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal while maintaining the margin to DNB. ~~The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS loop performance.~~

INSERT 3

REFERENCES

1. FSAR, Section 15.

BASES

ACTIONS

D.1, D.2, and D.3 (continued)

coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR requires verification ~~every 12 hours~~ that the required loops are in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering ~~other indications and alarms available to the operator in the control room to monitor RCS loop performance~~.

INSERT 3

SR 3.4.5.2

SR 3.4.5.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is ≥38% (Unit 1) and ≥10% (Unit 2) for required RCS loops. If the SG secondary side narrow range water level is <38% (Unit 1) and <10% (Unit 2), the tubes may become uncovered and the associated loop may not be capable of providing the heat sink for removal of the decay heat. ~~The 12-hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to a loss of SG level.~~

SR 3.4.5.3

INSERT 3

Verification that the required RCPs are OPERABLE ensures that safety analyses limits are met. The requirement also ensures that an additional RCP can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power availability to the required RCPs.

REFERENCES

None.

BASES

ACTIONS

B.1 and B.2 (continued)

criticality must not be reduced in this type of operation. Suspending the introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

INSERT 3

SR 3.4.6.1

This SR requires verification ~~every 12 hours~~ that one RCS or RHR loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. ~~The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS and RHR loop performance.~~

SR 3.4.6.2

SR 3.4.6.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is ≥38% (Unit 1) and ≥10% (Unit 2). If the SG secondary side narrow range water level is <38% (Unit 1) and <10% (Unit 2), the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.~~

SR 3.4.6.3

Verification that the required pump is OPERABLE ensures that an additional RCS or RHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~

REFERENCES

None.

BASES

ACTIONS

A.1 and A.2 (continued)

OPERABLE status or to restore the required SG secondary side water levels. Either Required Action A.1 or Required Action A.2 will restore redundant heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no RHR loop is in operation, except during conditions permitted by Notes 1 and 4, or if no loop is OPERABLE, all operations involving introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be suspended and action to restore one RHR loop to OPERABLE status and operation must be initiated. To prevent inadvertent criticality during a boron dilution, forced circulation from at least one RCP is required to provide proper mixing and preserve the margin to criticality in this type of operation. Suspending the introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Times reflect the importance of maintaining operation for heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification ~~every 12 hours~~ that the required loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. ~~The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RHR loop performance.~~

INSERT 3

SR 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are ≥38% (Unit 1) and ≥10% (Unit 2) ensures an alternate decay heat removal method via natural circulation in the event that the second RHR loop is not OPERABLE. If both RHR loops are OPERABLE, this Surveillance is not needed. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.3

Verification that a second RHR pump is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the RHR pump. If secondary side water level is $\geq$38% (Unit1) and $\geq$10% (Unit 2) in at least two SGs, this Surveillance is not needed. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience~~.

INSERT 3

REFERENCES

1. NRC Information Notice 95-35, "Degraded Ability of Steam Generators to Remove Decay Heat by Natural Circulation."

BASES

ACTIONS (continued)

B.1 and B.2

If no required RHR loops are OPERABLE or in operation, except during conditions permitted by Note 1, all operations involving introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be suspended and action must be initiated immediately to restore an RHR loop to OPERABLE status and operation. Boron dilution requires forced circulation for uniform dilution, and the margin to criticality must not be reduced in this type of operation. Suspending the introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must continue until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This SR requires verification ~~every 12 hours~~ that one loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. ~~The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RHR loop performance.~~

INSERT 3

SR 3.4.8.2

Verification that the required number of pumps are OPERABLE ensures that additional pumps can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~

REFERENCES None.

BASES

ACTIONS

C.1 and C.2 (continued)

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 3.4.9.1

This SR requires that during steady state operation, pressurizer level is maintained below the nominal upper limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level. ~~The Frequency of 12 hours corresponds to verifying the parameter each shift. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess level for any deviation and verify that operation is consistent with the safety analyses assumptions of ensuring that a steam bubble exists in the pressurizer. Alarms are also available for early detection of abnormal level indications.~~

INSERT 3

SR 3.4.9.2

The pressurizer heaters used to satisfy the pressure control function are comprised of one proportional control group and three backup groups. The heater groups are normally connected to the emergency power supplies (two to each Class 1E train of emergency power) and normally operate. The SR is satisfied when the power supplies are demonstrated to be capable of producing the minimum power and the associated pressurizer heaters are verified to be at their design rating. This may be done by testing the power supply output and by performing an electrical check on heater element continuity and resistance. This may also be done by energizing the heaters and measuring circuit current. ~~The Frequency of 18 months is considered adequate to detect heater degradation and has been shown by operating experience to be acceptable. The heater design and operation is consistent with the basis for an 18 month surveillance described in Section 6.6 of Ref. 3.~~

REFERENCES

1. FSAR, Section 15.

2. NUREG-0737, November 1980.

3. NUREG-1366, Improvements to Technical Specification Surveillance Requirements.

BASES

ACTIONS (continued)

G.1 and G.2

If the Required Actions of Condition F are not met, then 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 6 hours and to MODE 4 within 12 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. In MODES 4 5 and 6 (with the reactor vessel head on), automatic PORV OPERABILITY may be required. See LCO 3.4.12.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

INSERT 3

Block valve cycling verifies that the valve(s) can be opened and closed. ~~The basis for the Frequency of 92 days is the ASME Code (Ref. 3).~~

This SR is modified by two Notes. Note 1 modifies this SR by stating that it is not required to be performed with the block valve closed, in accordance with the Required Actions of this LCO. Opening the block valve in this condition increases the risk of an unisolable leak from the RCS since the PORV is already inoperable. Note 2 modifies this SR to allow entry into and operation in MODE 3 prior to performing the SR. This allows the surveillance to be performed in MODE 3 under operating temperature and pressure conditions, prior to entering MODE 1 or 2. In accordance with References 4, 5 and 6, administrative controls require this test be performed in MODES 3, 4 or 5 to adequately simulate operating temperature and pressure effects on PORV operation.

SR 3.4.11.2

INSERT 3

SR 3.4.11.2 requires a complete cycle of each PORV. Operating a PORV through one complete cycle ensures that the PORV can be manually actuated for mitigation of an SGTR. ~~The Frequency of 18 months is based on a typical refueling cycle and industry accepted practice.~~ The Note modifies this SR to allow entry into and operation in MODE 3 prior to performing the SR. This allows the surveillance to be performed in MODE 3 under operating temperature and pressure conditions, prior to entering MODE 1 or 2. In accordance with References 4, 5 and 6, administrative controls require this test be performed in MODES 3, 4 or 5 to adequately simulate operating temperature and pressure effects on PORV operation.

(continued)

BASES

ACTIONS

G.1 (continued)

The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of zero safety injection pumps and a maximum of two charging pumps are verified capable of injecting into the RCS and the accumulator discharge isolation valves are verified closed and locked out. Verification that each accumulator is isolated is only required when accumulator isolation is required as stated in Note 1 to the Applicability.

The safety injection pumps and charging pump are rendered incapable of injecting into the RCS, for example, through removing the power from the pumps by racking the breakers out under administrative control or by isolating the discharge of the pump by closed isolation valves with power removed from the operators or by a manual isolation valve secured in the closed position. Alternate methods of LTOP prevention may be employed to prevent a pump start such that a single failure will not result in an injection into the RCS. Providing pumps are rendered incapable of injecting into the RCS, they may be energized for purposes such as testing or for filling accumulators.

The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 3.4.12.4

INSERT 3

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction isolation valves are open and by testing it in accordance with the Inservice Testing Program. This Surveillance is only required to be performed if the RHR suction relief valve is being used to meet this LCO.

The RHR suction isolation valves are verified to be opened ~~every 72 hours~~. ~~The Frequency is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RHR suction valve remains open.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.4 (continued)

The ASME Code (Ref. 8), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

Insert a period "."

SR 3.4.12.5

INSERT 3

The RCS vent of ≥ 2.98 square inches is proven OPERABLE by verifying its open condition ~~either:~~

~~a. Once every 12 hours for a valve that is not locked, sealed, or otherwise secured in the open position.~~

~~b. Once every 31 days for other vent paths (e.g., a valve that is locked, sealed, or otherwise secured in position). A removed pressurizer safety valve or open manway also fits this category.~~

Any passive vent path arrangement must only be open when required to be OPERABLE. This Surveillance is required if the vent is being used to satisfy the pressure relief requirements of the LCO 3.4.12.

SR 3.4.12.6

The PORV block valve must be verified open ~~every 72 hours~~ to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This Surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

INSERT 3

~~The 72 hour Frequency is considered adequate in view of other administrative controls available to the operator in the control room, such as valve position indication, that verify that the PORV block valve remains open.~~

SR 3.4.12.7

Not Used

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.12.8

Performance of a COT is required within 12 hours after decreasing RCS temperature to ≤ 350°F ~~and every 31 days~~ on each required PORV to verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within pre-established calibration tolerances of the nominal PORV setpoints presented in the PTLR. PORV actuation could depressurize the RCS and is not required.

The 12 hour allowance considers the unlikelihood of a low temperature overpressure event during this time.

A Note has been added indicating that this SR is required to be performed 12 hours after decreasing RCS cold leg temperature to ≤ 350°F. The test must be performed within 12 hours after entering the LTOP MODES.

INSERT 3

SR 3.4.12.9

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required ~~every 18 months~~ to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

INSERT 3

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. FSAR, Chapter 15.
5. 10 CFR 50, Section 50.46.
6. 10 CFR 50, Appendix K.
7. Generic Letter 90-06.
8. ASME Code for Operation and Maintenance of Nuclear Power Plants.
9. FSAR, Chapter 5.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

the RCPB is maintained. Pressure boundary LEAKAGE would at first appear as unidentified LEAKAGE and can only be positively identified by inspection. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. Unidentified LEAKAGE and identified LEAKAGE are determined by performance of an RCS water inventory balance.

The RCS water inventory balance must be met with the reactor at steady state operating conditions (stable temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). This surveillance is modified by two Notes. Note 1 states that this SR is not required to be performed until 12 hours after establishing steady state operation near operating pressure. The 12 hour allowance provides sufficient time to collect and process necessary data after stable plant conditions are established.

Steady state operation is required to perform a proper inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows. An early warning of pressure boundary LEAKAGE or unidentified LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

Note 2 states that this SR is not applicable to primary to secondary LEAKAGE because LEAKAGE of 150 gallons per day cannot be measured accurately by an RCS water inventory balance.

INSERT 3

~~The 72 hour Frequency is a reasonable interval to trend LEAKAGE~~ and recognizes the importance of early leakage detection in the prevention of accidents. When non steady state operation precludes surveillance performance, the surveillance should be performed in a reasonable time period commensurate with the surveillance performance length, once steady state operation has been achieved~~, provided greater than 72 hours have elapsed since the last performance.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less than orequal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, the performance criterion is not met and LCO 3.4.17, "Steam Generator Tube Integrity," should be entered. The 150 gallons per day limit is measured at room temperature as described in Reference 8. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

The Surveillance is modified by a Note which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

INSERT 3

~~The Surveillance Frequency of 72 hours is a reasonable interval to trend primary to secondary LEAKAGE~~ and recognizes the importance of early leakage detection in the prevention of accidents. The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 8).

SURVEILLANCE REQUIREMENTS

1. 10 CFR 50, Appendix A, GDC 4 and 30.

2. Regulatory Guide 1.45, May 1973.

3. FSAR, Section 15.

4. FSAR, Section 3.6B.

5. NUREG-1061, Volume 3, November 1984.

6. 10 CFR 100.

7. NEI 97-06, "Steam Generator Program Guidelines".

8. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines".

BASES

ACTIONS

B.1 and B.2 (continued)

the containment. 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.

C.1

The inoperability of the RHR System interlock renders the RHR suction isolation valves capable of inadvertent opening at RCS pressures in excess of the RHR systems design pressure. If the RHR System interlock is inoperable, operation may continue as long as the affected RHR suction penetration is closed by at least one closed manual or deactivated automatic valve within 4 hours. This Action accomplishes the purpose of the function.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

Performance of leakage testing on each RCS PIV or isolation valve used to satisfy Required Action A.1 and Required Action A.2 is required to verify that leakage is below the specified limit and to identify each leaking valve. The leakage limit of 0.5 gpm per inch of nominal valve diameter up to 5 gpm maximum applies to each valve. Leakage testing requires a stable pressure condition greater than 150 psig.

For the two PIVs in series, the leakage requirement applies to each valve individually and not to the combined leakage across both valves. If the PIVs are not individually leakage tested, one valve may have failed completely and not be detected if the other valve in series meets the leakage requirement. In this situation, the protection provided by redundant valves would be lost.

9 but may be extended

Testing is to be performed every ~~18~~ months, ~~a typical refueling cycle,~~ if the plant does not go into MODE 5 for at least 7 days. ~~The 18 month Frequency is consistent with 10 CFR 50.55a(g) (Ref. 8) as contained in the Inservice Testing Program, is within frequency allowed by the American Society of Mechanical Engineers (ASME) Code (Ref. 7), and is based on the need to perform such surveillances under the conditions that apply during an outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

INSERT 3

In addition, testing must be performed once after the check valve has been opened by flow or exercised to ensure tight reseating. PIVs disturbed in the performance of this Surveillance should also be tested unless documentation shows that an infinite testing loop cannot practically be

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1 (continued)

avoided. Testing must be performed within 24 hours after the check valve has been reseated (except as provided by Note 1). Within 24 hours is a reasonable and practical time limit for performing this test after opening or reseating a check valve.

The leakage limit is to be met at the RCS pressure associated with MODES 1 and 2. This permits leakage testing at high differential pressures with stable conditions not possible in the MODES with lower pressures.

Entry into MODES 3 and 4 is allowed to establish the necessary differential pressures and stable conditions to allow for performance of this Surveillance. The Note that allows this provision is complementary to the Frequency of prior to entry into MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months except for RHR isolation valves 8701A, 8701B, 8702A and 8702B. This exception is allowed since these RHR valves have control room position indication, inadvertent opening interlocks and a system high pressure alarm. In addition, this Surveillance is not required to be performed on the RHR System when the RHR System is aligned to the RCS in the shutdown cooling mode of operation. PIVs contained in the RHR shutdown cooling flow path must be leakage rate tested after RHR is secured and stable unit conditions and the necessary differential pressures are established.

Testing is not required for the RHR suction isolation valves more frequently than 18 months as these valves are motor-operated with control room position indication, inadvertent opening interlocks and system high pressure alarms.

SR 3.4.14.2

Verifying that the RHR System interlocks are OPERABLE ensures that RCS pressure will not overpressurize the RHR system. The interlock setpoint that prevents the valves from being opened is set so the actual RCS pressure must be < 442 psig to open the valves. This setpoint ensures the RHR design pressure will not be exceeded and the RHR relief valves will not lift.

INSERT 3

The 18 month Frequency is based on the need to perform the Surveillance under conditions that apply during a plant outage. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.

This SR is not applicable when using the RHR System suction relief valves for cold overpressure protection in accordance with SR 3.4.12.7.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1 (continued)

Frequency of 12 hours is based on instrument ~~reliability and is reasonable for detecting off normal conditions~~.

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. ~~The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation.~~

INSERT 3

SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. ~~The Frequency of 18 months is a typical refueling cycle and considers channel reliability. Again, operating experience has proven that this Frequency is acceptable~~.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.

2. Regulatory Guide 1.45.

3. FSAR, Section 5.2.

4. NUREG-609, "Asymmetric Blowdown Loads on PWR Primary Systems," 1981.

5. Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops."

6. FSAR, Section 3.6B.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the noble gas specific activity of the reactor coolant ~~at least once every 7 days~~. While basically a quantitative measure of radionuclides with half lives longer than 10 minutes, excluding iodines, this measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in noble gas specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. ~~The 7 day Frequency considers the unlikelihood of a gross fuel failure during the time.~~

INSERT 3

If a specific noble gas nuclide listed in the definition of DOSE EQUIVALENT XE-133 in Specification 1.1, "Definitions," is not detected, it should be assumed to be present at the minimum detectable activity.

The NOTE modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

SR 3.4.16.2

This Surveillance is performed in MODE 1 only to ensure iodine specific activity remains within the LCO limit during normal operation and following fast power changes when iodine spiking is more apt to occur. ~~The 14 day Frequency is adequate to trend changes in the iodine activity level, considering noble gas activity is monitored every 7 days~~. The Frequency, between 2 and 6 hours after a power change $\geq$ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following iodine spike initiation; samples at other times would provide inaccurate results.

The NOTE modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

SR 3.4.16.3

DELETED

(continued)

BASES

ACTIONS (continued)

C.1 and C.2

If the accumulator cannot be returned to OPERABLE status 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 MODE 3 within 6 hours and RCS pressure reduced to ≤1000 psig within 12 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.

D.1

If more than one accumulator is inoperable, the plant is in a condition outside the accident analyses; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Each accumulator valve should be verified to be fully open ~~every 12 hours.~~ This verification ensures that the accumulators are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in not meeting accident analyses assumptions~~.~~ ~~This Frequency is considered reasonable in view of other administrative controls that ensure a mispositioned isolation valve is unlikely.~~

INSERT 3

SR 3.5.1.2 and SR 3.5.1.3

~~Every 12 hours,~~ borated water volume and nitrogen cover pressure are verified for each accumulator. ~~This Frequency is sufficient to ensure adequate injection during a LOCA. Because of the static design of the accumulator, a 12 hour Frequency usually allows the operator to identify changes before limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.~~

Each accumulator is equipped with two level and two pressure channels. One channel of each is designated the primary channel and used for this surveillance except when declared inoperable. The second channel is used to perform channel checks and as backup to the primary channel. Surveillances are routinely performed on both channels.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.2 and SR 3.5.1.3 (continued)

Control Board indication may be used in the surveillances of the required indicated water volume. To allow for a 5% instrument inaccuracy and a 1% tank tolerance, control room indicated values of 39% and 61% are conservative and may be used in surveillance. Other means of surveillance which consider measurement uncertainty may also be used.

SR 3.5.1.4

INSERT 3

The boron concentration should be verified to be within required limits for each accumulator ~~every 31 days~~ since the static design of the accumulators limits the ways in which the concentration can be changed. ~~The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage~~. Sampling the affected accumulator within 6 hours after a 1% volume increase (101 gallons) will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the refueling water storage tank (RWST), and the RWST has not been diluted since verifying that its boron concentration satisfies SR 3.5.4.3, because the water contained in the RWST is nominally within the accumulator boron concentration requirements. This is consistent with the recommendation of NUREG-1366 (Ref. 6).

SR 3.5.1.5

Verification ~~every 31 days~~ that power is removed from each accumulator isolation valve operator when the RCS pressure is > 1000 psig ensures that an active failure could not result in the undetected closure of an accumulator motor operated isolation valve. If this were to occur, only two accumulators would be available for injection given a single failure coincident with a LOCA.

INSERT 3

~~Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that power is removed.~~

This SR allows power to be supplied to the motor operated isolation valves when RCS pressure is ≤ 1000 psig.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable. Securing these valves in position by removal of power by a control board switch in the correct position ensures that they cannot change position as a result of an active failure or be inadvertently misaligned. These valves are of the type, described in References 6 and 7, that can disable the function of both ECCS trains and invalidate the accident analyses~~. A 12 hour Frequency is considered reasonable in view of other administrative controls that will ensure a mispositioned valve is unlikely~~. As noted in LCO Note 1, both Safety Injection pump flow paths may each be isolated for two hours in MODE 3 by closure of one or more of these valves to perform pressure isolation valve testing.

INSERT 3

SR 3.5.2.2

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 actuation signal is allowed to be in a non-accident position provided the valve will automatically reposition within the proper stroke time. This Surveillance 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 administrative control, and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.~~

SR 3.5.2.3

Venting of the ECCS pump casing and accessible discharge piping high points prior to entering MODE 3 and following any maintenance or operations activity which drains portions of the system, ensures the system is full of water and will perform properly (i.e., allows injecting the full ECCS capacity into the RCS on demand).

The CCP design and attached piping configuration allow the CCP to vent the accumulated gases via the attached suction and discharge piping. Continuous venting of the suction piping to the Volume Control tank (VCT) and manual venting of the discharge piping high points satisfies the pump casing venting requirements for the CCPs.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. The following ECCS pumps are required to develop the indicated differential pressure on recirculation flow:

1)	Centrifugal charging pump	≥ 2370 psid,
2)	Safety injection pump	≥ 1440 psid, and
3)	RHR pump	> 170 psid.

This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. SRs are specified in the Inservice Testing Program of the ASME Code. The ASME Code and the Technical Requirements Manual provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.5 and SR 3.5.2.6 INSERT 3

These Surveillances demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SI signal and that each ECCS pump starts on receipt of an actual or simulated SI signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned plant transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the Inservice Testing Program.~~

SR 3.5.2.7

The correct alignment of throttle valves in the ECCS flow path on an SI signal is necessary for proper ECCS performance. Valves 8810A, B, C, D

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.7 (continued)

are provided in the charging pump to cold leg injection lines. Valves 8822A, B, C, D are provided in the SI pump to cold leg injection lines. These manual throttle valves are positioned following flow balancing and have mechanical locks to ensure that the proper positioning for restricted flow to a ruptured cold leg is maintained and that the other cold legs receive at least the required minimum flow. Valves 8816A, B, C, D are provided in the SI pump to hot leg recirculation lines. These manual throttle valves are positioned following flow balancing and have mechanical locks to ensure flow balancing and to limit SI pump runout~~.~~ ~~The 18 month Frequency is based on the same reasons as those stated in SR 3.5.2.5 and SR 3.5.2.6.~~

SR 3.5.2.8

INSERT 3

Periodic inspections of the containment sump suction inlet ensure that it is unrestricted and stays in proper operating condition. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, on the need to have access to the location, and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency has been found to be sufficient to detect abnormal degradation and is confirmed by operating experience.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
2. 10 CFR 50.46.
3. FSAR, Sections 6.3 and 7.6.
4. FSAR, Chapter 15, "Accident Analysis."
5. NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
6. IE Information Notice No. 87-01.
7. BTP EICSB-18, Application of the Single Failure Criteria to Manually-Controlled Electrically-Operated Valves.

BASES

ACTIONS (continued)

B.1

With the RWST inoperable for reasons other than Condition A (e.g., water volume), it must be restored to OPERABLE status within 1 hour.

In this Condition, neither the ECCS nor the Containment Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the plant in a MODE in which the RWST is not required. The short time limit of 1 hour to restore the RWST to OPERABLE status is based on this condition simultaneously affecting redundant trains.

C.1 and C.2

If the RWST cannot be returned to OPERABLE status 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 6 hours and to MODE 5 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 3.5.4.1

The RWST borated water temperature should be verified ~~every 24 hours~~ to be within the limits assumed in the accident analyses band. ~~This Frequency is sufficient to identify a temperature change that would approach either limit and has been shown to be acceptable through operating experience.~~

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when ambient air temperatures are within the operating limits of the RWST. With ambient air temperatures within the band, the RWST temperature should not exceed the limits.

INSERT 3

SR 3.5.4.2

The RWST water volume should be verified ~~every 7 days~~ to be above the required minimum level in order to ensure that a sufficient initial supply is available for injection and to support continued ECCS and Containment Spray System pump operation on recirculation. ~~Since the RWST volume is normally stable and the contained volume required is protected by an alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.4.2 (continued)

Control Board indication may be used in the surveillances of the required indicated RWST water volume. The indicated level of 95%, which includes 5% measurement uncertainty, is a conservative verification of contained volume. Other means of surveillance which consider measurement uncertainty may also be used.

SR 3.5.4.3

The boron concentration of the RWST should be verified ~~every 7 days~~ to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. ~~Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience~~.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.

INSERT 3

BASES

ACTIONS (continued)

B.1 and B.2

When the Required Actions cannot be completed within the required Completion Time, a controlled shutdown must be initiated. The Completion Time of 6 hours for reaching MODE 3 from MODE 1 is a reasonable time for a controlled shutdown, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators. Continuing the plant shutdown begun in Required Action B.1, an additional 6 hours is a reasonable time, based on operating experience and normal cooldown rates, to reach MODE 4, where this LCO is no longer applicable.

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

The surveillance ensures the seal injection flow is less than 40 gpm with charging header pressure greater than or equal to 145 psig (130 psig + 15 psig for instrument uncertainty) above RCS pressure.

Verification ~~every 31 days~~ that the manual seal injection throttle valves are adjusted to give a flow within the limit ensures that proper manual seal injection throttle valve position, and hence, proper seal injection flow, is maintained~~. The Frequency of 31 days is based on engineering judgment and is consistent with other ECCS valve Surveillance Frequencies. The Frequency has proven to be acceptable through operating experience.~~

INSERT 3

As noted, the Surveillance is not required to be performed until 4 hours after the RCS pressure has stabilized within a ± 20 psig range of normal operating pressure. The RCS pressure requirement is specified since this configuration will produce the required pressure conditions necessary to assure that the manual valves are set correctly. The exception is limited to 4 hours to ensure that the Surveillance is timely.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
2. 10 CFR 50.46.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leakage Rate Testing Program. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during initial air lock and containment OPERABILITY testing. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by the Containment Leakage Rate Testing Program.

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 has been added to this SR requiring the results to be evaluated against the acceptance criteria which is applicable to SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C containment leakage rate.

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports 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 opening of the inner and outer doors will not inadvertently occur. INSERT 3 ~~Due to the reliable nature of this interlock, and given~~ that the interlock mechanism is not normally challenged when the containment air lock door 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 containment OPERABILITY if the Surveillance were performed with the reactor at power. The 24 month Frequency for the interlock is justified based on generic operating experience. The Frequency is based on engineering judgement and is considered adequate given that the interlock is not challenged during use of the airlock.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Each 48 inch Containment Purge and 12 inch Hydrogen Purge valve is required to be verified sealed closed ~~at 31 day intervals.~~ This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a Containment Purge or Hydrogen Purge valve. These valves are not designed to be opened in MODES 1 to 4. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A Containment Purge or Hydrogen Purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness~~.~~ ~~The Frequency is a~~ ~~result of an NRC initiative, Multi-Plant Action No. B-24 (Ref. 5), related to containment purge valve use during plant operations.~~ In the event Containment Purge or Hydrogen Purge valve leakage requires entry into Condition D, the Surveillance permits opening one purge valve in a penetration flow path to perform repairs.

SR 3.6.3.2

Not Used

INSERT 3

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification through a system walkdown (which may include the use of local or remote indicators), that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. ~~Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions.~~ The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed positions, since these were verified to be in the correct position upon locking, sealing, or securing.

The Note applies to valves and blind flanges located in high radiation areas

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.5

Verifying that the isolation time of each automatic power operated containment isolation valve is within limits is required to demonstrate OPERABILITY. An automatic power operated containment isolation valve is a containment isolation valve which is required to be closed by an automatic (i.e., other than operator manual) actuation signal and is powered by other than manual actuation (e.g., by an air or motor operator). The isolation time test ensures the valve will isolate in a time period less than or equal to that assumed in the FSAR [Ref. 2]. The isolation time and Frequency of this SR are in accordance with the Technical Requirements Manual and the Inservice Testing Program.

SR 3.6.3.6

Not used.

SR 3.6.3.7

The Containment Purge, Hydrogen Purge, and Containment Pressure Relief valves with resilient seals, are leakage rate tested per the requirements of 10 CFR 50, Apppendix J, Option B to ensure OPERABILITY.

The containment purge, hydrogen purge, and containment pressure relief valves are tested in accordance with the Containment Leakage Rate Testing Program. Leakage rate acceptance criteria applies as follows:

a. The inboard and outboard isolation valves with resilient material seals in each locked closed 48 inch containment purge and 12 inch hydrogen purge supply and exhaust penetration measured leakage rate is < 0.05 L_a when pressurized to P_a.

b. Each 18 inch containment pressure relief discharge isolation valve with resilient material seals measured leakage rate is < 0.06 L_a when pressurized to P_a.

The Note is a clarification that leakage rate testing is not required for containment purge valves with resilient seals when their penetration flow path is isolated by a leak tested blank flange.

INSERT 3

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each Phase "A" automatic containment isolation valve will actuate to its isolation position on a Phase "A" Isolation signal, each Phase "B" automatic containment isolation valve will actuate to its isolation position on a containment Phase "B" Isolation signal, and each pressure relief discharge valve actuates to its isolation position on a Containment Ventilation Isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~Operating experience has shown that these components usually pass this Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.6.3.9

Not used

INSERT 3

SR 3.6.3.10

Not used.

SR 3.6.3.11

Not used.

SR 3.6.3.12

Not used.

SR 3.6.3.13

Not used.

REFERENCES

1. FSAR, Section 15.
2. FSAR, Section 6.2.
3. Standard Review Plan 6.2.4.

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

MODE 3 within 6 hours and to MODE 5 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 3.6.4.1

Verifying that containment pressure is within limits ensures that unit operation remains within the limits assumed in the containment analysis.

INSERT 3

~~The 12 hour Frequency of this SR was developed based on operating experience related to trending of containment pressure variations during the applicable MODES. 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 containment pressure condition.~~

REFERENCES

1. FSAR, Section 6.2.
2. 10 CFR 50, Appendix K.

BASES

ACTIONS (continued)

B.1 and B.2

If the containment average air temperature cannot be restored to within its 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 6 hours and to MODE 5 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 3.6.5.1

Verifying that containment average air temperature is within the LCO limit ensures that containment operation remains within the limit assumed for the containment analyses. In order to determine the containment average air temperature, an adjusted average is calculated using two temperature measurements, on fixed or portable instruments. The temperature measurements are taken at the following locations: a) the containment dome, at or above Elevation 1000'-6"; b) the containment floor, at or above Elevation 860'-0". At least one of the temperatures must be taken at or above Elevation 1000'-6". The locations within the containment were selected to provide a representative sample of the overall containment atmosphere. ~~The 24 hour Frequency of this SR is considered acceptable based on observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). 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 containment temperature condition.~~

INSERT 3

REFERENCES

1. FSAR, Section 6.2.
2. 10 CFR 50.49.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1

Verifying the correct alignment for manual, power operated, and automatic valves in the containment spray flow path provides assurance that the proper flow paths will exist for Containment Spray System 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. This SR does not require any testing or valve manipulation. Rather, it involves verification through a system walkdown (which may include the use of local or remote indicators), that those valves outside containment (only check valves are inside containment) and capable of potentially being mispositioned are in the correct position.

INSERT 3

SR 3.6.6.2

Not Used

SR 3.6.6.3

Not Used

SR 3.6.6.4

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head (specified in the Technical Requirements Manual) ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by the ASME Code (Ref. 5). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow via a test header. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by abnormal performance. The Frequency of the SR is in accordance with the Inservice Testing Program.

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification that each automatic containment spray valve actuates to its correct position on an actual or simulated actuation of a containment "P" (High-3) signal and that each containment spray pump starts upon receipt of an actual or simulated actuation of a containment "S" (High-1) and "P" (High-3) pressure signals. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.5 and SR 3.6.6.6 (continued)

INSERT 3

position under administrative controls. ~~Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.6.6.7

Not Used

SR 3.6.6.8

With the containment spray inlet valves closed and the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, confirmation of operability following maintenance activities that can result in obstruction of spray nozzle flow is considered adequate to detect obstruction of the nozzles. Confirmation that the spray nozzles are unobstructed may be obtained by utilizing foreign materials exclusion (FME) controls during maintenance, a visual inspection of the affected portions of the system, or by an air or smoke flow test following maintenance involving opening portions of the system downstream of the containment isolation valves or draining of the filled portions of the system inside containment. Maintenance that could result in nozzle blockage is generally a result of a loss of foreign material control or a flow of borated water through a nozzle. Should either of these events occur, a supervisory evaluation will be required to determine whether nozzle blockage is a possible result of the event. For the loss of FME event, an inspection or flush of the affected portions of the system should be adequate to confirm that the spray nozzles are unobstructed since water flow would be required to transport any debris to the spray nozzles. An air flow or smoke test may not be appropriate for a loss of FME event but may be appropriate for the case where borated water inadvertently flows through the nozzles.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 38, GDC 39, GDC 40, GDC 41, GDC 42, and GDC 43.

2. 10 CFR 50, Appendix K.

3. FSAR, Section 6.2.1.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that MSIV closure time is ≤ 5 seconds. The hand switch may be used as the actuation signal to perform this surveillance. The MSIV isolation time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

The Frequency is in accordance with the Inservice Testing (IST) Program. This test is allowed to be conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

SR 3.7.2.2

This SR verifies that each MSIV can close on an actual or simulated main steam line isolation actuation signal. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

INSERT 3

The frequency of MSIV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

This test is allowed to be conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

REFERENCES

1. FSAR, Section 10.3.
2. FSAR, Section 6.2.
3. FSAR, Chapter 15.
4. 10 CFR 100.11.

BASES

ACTIONS

E.1 and E.2 (continued)

Completion Time, 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 6 hours, and in MODE 4 within 12 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 3.7.3.1

This SR verifies that the closure time of each FIV, FCV, and associated bypass valves is ≤ 5 seconds. The FIV and FCV isolation times are assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. This is consistent with RG 1.22 (Ref. 4).

The Frequency for this SR is in accordance with the Inservice Testing Program. Per Ref. 5, if it is necessary to adjust stem packing to stop packing leakage and if a required stroke test is not practical in the current plant mode, it should be shown by analysis that the packing adjustment is within torque limits specified by the manufacturer for the existing configuration of packing, and that the performance parameters of the valve are not adversely affected. A confirmatory test must be performed at the first available opportunity when plant conditions allow testing. Packing adjustments beyond the manufacturer's limits may not be performed without (1) an engineering analysis and (2) input from the manufacturer, unless tests can be performed after adjustments.

SR 3.7.3.2

This SR verifies that each FIV and associated bypass valve can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

INSERT 3

The frequency of this surveillance is every 18 months. The ~~18 month~~ Frequency for testing is based on the refueling ~~cycle~~. Operating experience has shown that these components ~~usually~~ pass the Surveillance when performed at the ~~18 month~~ Frequency. Therefore, this Frequency is ~~acceptable~~ from a reliability standpoint.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. This SR 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 SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

INSERT 3

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~

This SR is modified by a note stating that one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator water level control, if it is capable of being manually realigned to the AFW mode of operation and provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable and applies only when the unit is below 10% RATED THERMAL POWER. Since AFW may be used during startup, shutdown, hot standby operations, and hot shutdown operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY is maintained. The ability to realign the affected AFW train(s) to a standby condition or to an in-service condition supplying feedwater to the steam generator(s) assures the intended safety function is available. Realignment of the AFW train(s)is normally performed from the Control Room. However, when explicitly allowed by Operations' procedure, this provision may also be applied to local manual operation of AFW valves.

SR 3.7.5.2

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by the ASME Code (Ref. 2). The motor driven pumps should develop a differential pressure of ≥ 1380 psid at a flow of ≥ 430 gpm. The turbine driven pump should develop a differential pressure of ≥ 1438 psid at a flow of ≥ 860 gpm. Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow through a test line. This test confirms one point on the pump design curve

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.2 (continued)

and is indicative of overall performance. Instrument uncertainty is not included in the above flow and differential pressure values but is addressed in the surveillance testing procedure. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code (Ref. 2) (only required at 3 month intervals) satisfies this requirement.

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation generated by an auxiliary feedwater actuation signal. The Steam Generator Blowdown, Steam Generator Blowdown Sample, and Unit 2 Feedwater Split Flow Bypass valves close on an auxiliary feedwater actuation to ensure auxiliary feedwater is delivered to the steam generator upper nozzles and is retained in the steam generator for decay heat removal. The AFW flow control valves trip to auto (open) on an auxiliary feedwater actuation to ensure full flow is delivered to each steam generator flow path. The steam admission valves open to supply the turbine driven auxiliary feedwater pump. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.~~

INSERT 3

This SR is modified by a note stating that one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator water level control, if it is capable of being manually realigned to the AFW mode of operation and provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable and applies only when the unit is below 10% RATED THERMAL POWER. Since AFW may be used during startup, shutdown, hot standby operations, and hot shutdown operations for steam generator level control,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.3 (continued)

and these manual operations are an accepted function of the AFW system, OPERABILITY is maintained. The ability to realign the affected AFW train(s) to a standby condition or to an in-service condition supplying feedwater to the steam generator(s) assures the intended safety function is available. Realignment of the AFW train(s) is normally performed from the Control Room. However, when explicitly allowed by Operations' procedure, this provision may also be applied to local manual operation of AFW valves.

SR 3.7.5.4

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation generated by an auxiliary feedwater actuation signal in MODES 1, 2, and 3. In MODE 4, the required pump is already operating and the autostart function is not required.

INSERT 3

The 18 month Frequency is based on the need to perform ~~this Surveillance~~ under the conditions that apply during ~~a unit outage~~ and the potential for an unplanned transient ~~if the Surveillance~~ were performed with the reactor at ~~power.~~

This SR is modified by two notes. Note 1 indicates that the SR be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test. Note 2 states that one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator water level control, if it is capable of being manually realigned to the AFW mode of operation and provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable and applies only when the unit is below 10% RATED THERMAL POWER. Since AFW may be used during startup, shutdown, hot standby operations, and hot shutdown operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY is maintained. The ability to realign the affected AFW train(s) to a standby condition or to an in-service condition supplying feedwater to the steam generator(s) assures the intended safety function is available. Realignment of the AFW train(s) is normally performed from the Control Room. However, when explicitly allowed by Operations' procedure, this provision may also be applied to local manual operation of AFW valves.

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

within 6 hours, and in MODE 4, within 12 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 3.7.6.1

This SR verifies that the CST contains the required volume of cooling water.

The required CST volume surveillance of 53% level is based on the use of control board indications which include a 3.5% measurement uncertainty.

INSERT 3

~~The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the CST inventory between checks. Also, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to abnormal deviations in the CST level.~~

REFERENCES

1. FSAR, Sections 3.9B, 7.3, and 9.2.6.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.
4. BTP RSB 5-1, Design Requirements of the Residual Heat Removal System.
5. FSAR Appendix 5A.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1 (continued)

in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance 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 based on engineering judgment, ~~is consistent~~ with the procedural controls governing ~~valve operation~~, and ensures correct valve ~~positions.~~

INSERT 3

SR 3.7.7.2

This SR verifies proper automatic operation of each automatic CCW valve on its associated actual or simulated ESF actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on~~ the need to perform this Surveillance under the conditions that apply ~~during a~~ unit 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 Surveillance when performed at the 18 month ~~Frequency~~. Therefore, the Frequency is acceptable from a ~~reliability~~ standpoint.

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated Safety Injection actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. ~~The 18 month Frequency is based on the~~ need to perform this Surveillance under the conditions that apply ~~during a~~ unit 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 Surveillance when performed at the 18 month ~~Frequency~~. Therefore, the Frequency is acceptable from a ~~reliability~~ standpoint.

REFERENCES

1. FSAR, Sections 3.9B, 7.3, and 9.2.2.

2. FSAR, Section 6.2.

BASES

ACTIONS

B.1 (continued)

generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable SSWS train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

C.1 and C.2

If the SSWS train or an SSW Pump on the opposite unit and its associated cross-connects cannot be restored to OPERABLE status within the associated Completion Time, 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 6 hours and in MODE 5 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 3.7.8.1

This SR is modified by a Note indicating that the isolation of the SSWS components or systems may render those components inoperable, but does not affect the OPERABILITY of the SSWS.

Verifying the correct alignment for manual, power operated, and automatic valves in the SSWS flow path provides assurance that the proper flow paths exist for SSWS operation. This SR 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 being locked, sealed, or secured. 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.

INSERT 3

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.2

This SR verifies proper position or manual operation of the cross-connect valves between units. ~~The 92 day frequency is based on the frequency in ASME XI (Ref. 7) for testing of Category A and B valves and is consistent with Generic Letter 91-13 (Ref. 4).~~

INSERT 3

SR 3.7.8.3

This SR verifies proper automatic operation of the SSWS pumps on an actual or simulated Safety Injection actuation signal. The SSWS is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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 Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

REFERENCES

1. FSAR, Section 9.2.1.
2. FSAR, Section 6.2.
3. FSAR, Section 5.4.7.
4. Generic Letter 91-13, "Request for Information related to the Resolution of Generic Issue 130, Essential Service Water System Failures at Multi-unit Sites, Pursuant to 10 CFR 50.54(f)."
5. General Design Criteria 5 and 44.
6. TXX-92410, "License Amendment Request 92-002, Combined Unit 1 and 2 Technical Specifications" dated August 31, 1992.
7. ASME XI.

BASES

ACTIONS (continued)

B.1 and B.2

If the level cannot be restored to OPERABLE status within the associated Completion Time, or if the SSI is inoperable for reasons other than Condition A, 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 6 hours and in MODE 5 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 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the SSWS pumps. ~~The 24 hour Frequency is based on operating~~ experience related to trending of the parameter variations ~~during the~~ applicable MODES. This SR ~~verifies that the~~ SSI water level is ≥ 770 ft mean ~~sea level~~.

INSERT 3

SR 3.7.9.2

This SR verifies that the SSWS is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. ~~The 24~~ hour Frequency is based on operating experience related to ~~trending of the~~ parameter variations during the ~~applicable MODES~~. This SR verifies that the water ~~temperature~~ of the Station Service Water System intake is ≤ 102°F.

REFERENCES

1. FSAR, Sections 2.3, 2.4 and 9.2.5.
2. Regulatory Guide 1.27.

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

E.1 and E.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CREFS trains inoperable or with one or more CREFS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

F.1

If both CREFS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than an inoperable CRE boundary (i.e., Condition B), the CREFS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, each train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal from humidity in the ambient air. Filtration units with heaters must be operated for ≥ 10 continuous hours with the heaters energized. Filtration units without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. ~~The 31 day Frequency is based on the reliability of the equipment and the two train redundancy.~~

INSERT 3

SR 3.7.10.2

This SR verifies that the required CREFS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREFS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.2 (continued)

minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

The VFTP filtration testing requirements of Sections 5.5.11a, b, and c are not required for an Emergency Pressurization Unit when being testing (1) during a periodic test (e.g., 18 months or after 720 hours of operation), (2) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (3) following painting, fire, or chemical release for the corresponding CREFS train to be OPERABLE.

SR 3.7.10.3

This SR verifies that each CREFS train starts and operates on an actual or simulated Safety Injection, Loss-of-Offsite Power, or Intake Vent-High Radiation actuation signal. INSERT 3 ~~The Frequency of 18 months is based on industry operating experience and is consistent with the typical refueling cycle.~~ Each actuation signal must be verified (overlapping testing is acceptable).

SR 3.7.10.4

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 than 5 rem whole body or its equivalent to any part of the body and the CRE occupants are protected from hazardous chemicals and smoke. For Comanche Peak there is no CREFS actuation for hazardous chemical releases or smoke and there are no Surveillance Requirements that verify operability for 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 analyses 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 the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 4) which endorses, with

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

If both CRACS trains are inoperable in MODE 1, 2, 3, or 4, with at least 100% of the required heat removal capability equivalent to a single OPERABLE train available, action must be taken to restore OPERABLE status in 30 days. In this condition, the remaining OPERABLE air conditioning units in both trains are adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CRACS air conditioning units could result in loss of CRACS function. The 30 day Completion Time is based on the low probability of an event challenging the remaining units and the consideration that the remaining train can provide the required protection.

If both CRACS trains are inoperable in MODE 1, 2, 3, or 4, the control room CRACS may not be capable of performing its intended function. Therefore, as an alternative to Required Action E.1, LCO 3.0.3 may be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

INSERT 3

This SR verifies that the heat removal capability of the system is sufficient to remove the heat load assumed in the safety analyses in the control room. This SR consists of a combination of testing and calculations. ~~The 18 month Frequency is appropriate since significant degradation of the CRACS is slow and is not expected over this time period.~~ The CRACS heating coils are not required to be included in this SR.

REFERENCES

1. FSAR, Section 6.4.

2. FSAR, Section 9.4.1.

BASES

ACTIONS

C.1 (continued)

The 7 day Completion Time is appropriate because the risk contribution is less than that for the ECCS (72 hour Completion Time), and this system is not a direct support system for the ECCS. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

Concurrent failure of two PPVS trains would result in the loss of functional capability; therefore, LCO 3.0.3 must be entered immediately.

D.1 and D.2

If the PPVS train or negative pressure envelope cannot be restored to OPERABLE status within the associated Completion Time, 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 6 hours, and in MODE 5 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 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Monthly heater operations dry out any moisture that may have accumulated in the charcoal from humidity in the ambient air. Systems with heaters must be operated ≥ 10 continuous hours with the heaters energized with flow through the HEPA filters and charcoal adsorbers. Operation is to be initiated from the Control Room. ~~The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.~~

INSERT 3

SR 3.7.12.2

This SR verifies that the required PPVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The ECCS PREACS filter tests are in accordance with Reference 4. The VFTP includes testing HEPA filter performance, charcoal adsorbers 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 3.7.12.3

This SR verifies that each PPVS train starts and operates on an actual or simulated Safety Injection actuation signal~~. The 18 month Frequency is consistent with that specified in Reference 4.~~

SR 3.7.12.4

This SR verifies the integrity of the negative pressure envelope. The ability of the Auxiliary and Safeguards buildings to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper functioning of the PPVS. During the post accident mode of operation, the PPVS is designed to maintain a slight negative pressure in the Auxiliary, Fuel and Safeguards buildings, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The acceptance criteria of ≤ -0.05 inches water gauge relative to atmospheric pressure was selected as a reasonable measure of the integrity of the negative pressure boundary. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 6).

INSERT 3

This test is conducted with the tests for filter penetration; thus, an 18 month Frequency on a STAGGERED TEST BASIS is consistent with that specified in Reference 4.

SR 3.7.12.5

Not used.

SR 3.7.12.6

This SR is required to verify the shutdown of the non-ESF fans to prevent bypass of the ESF Filtration units. The plant design does not include bypass dampers, however, bypass of the filter units will occur if the non-ESF fans are still running when the ESF fans start. Therefore, to prevent bypass, the non-ESF fans must be stopped. The SR demonstrates that the non-ESF fans stop on an actual or simulated ESF actuation signal (safety injection signal). Verification of the tripping of each non-ESF fan on an SI signal is necessary to ensure that the system functions properly. ~~A frequency of 18 months is consistent with SR 3.7.12.3.~~

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

assumes that all fuel rods fail, although analysis shows that only the first few rows fail from a hypothetical maximum drop. The fuel storage pool water level satisfies Criteria 2 and 3 of 10CFR50.36(c)(2)(ii).

LCO

The fuel storage area water level is required to be ≥ 23 ft over the top of the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel storage and movement within the spent fuel storage areas.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the spent fuel storage areas, since the potential for a release of fission products exists.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the initial conditions for prevention of an accident cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel storage areas water level is lower than the required level, the movement of irradiated fuel assemblies in the spent fuel storage areas is immediately suspended to a safe position. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1 INSERT 3

This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage pool must be checked periodically. ~~The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience.~~

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

When the concentration of boron in the fuel storage pool is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This action is most efficiently achieved by immediately suspending the movement of fuel assemblies. The concentration of boron is restored simultaneously with suspending movement of fuel assemblies. Prior to resuming movement of fuel assemblies, the concentration of boron must be restored. This requirement does not preclude movement of a fuel assembly to a safe position.

The Required Actions are modified by a Note indicating that LCO 3.0.3 does not apply. If the LCO is not met while moving irradiated fuel assemblies in MODE 5 or 6, LCO 3.0.3 would not be applicable. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, inability to suspend movement of fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1 INSERT 3

This SR verifies that the concentration of boron in the fuel storage pool is within the required limit. As long as this SR is met, the analyzed accidents are fully addressed. ~~The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place over such a short period of time.~~

REFERENCES

1. FSAR, Section 9.1.

2. License Amendment Requests 94-22, 98-08, and 00-05, Spent Fuel Storage Capacity Increase, Docket NOS 50-445 and 50-446, CPSES.

3. Comanche Peak High Density Spent Fuel Rack Criticality Analysis using Soluble Boron Credit and No Outer Wrapper Plate, dated July, 2001 (Enclosure 2 to TXX-01118).

4. WCAP-14416 NP-A, Rev. 1, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology," November 1996.

5. FSAR, Section 15.7.4.

6. American Nuclear Society, "American National Standard for Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors," ANSI/ANS-8.1-1983, October 7, 1983.

BASES

SURVEILLANCE REQUIREMENTS)

SR 3.7.18.1 (continued)

releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. ~~The 31 day Frequency is based on the detection of increasing trends of the level of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.~~

INSERT 3

REFERENCES

1. 10 CFR 100.11.
2. FSAR, Chapter 15.

BASES

ACTIONS

A. 1 (continued)

OPERABLE Safety Chilled Water System train could result in loss of the Safety Chilled Water System function. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time.

B.1 and B.2

If the Safety Chilled Water System train cannot be restored to OPERABLE status within the associated Completion Time, 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 6 hours and MODE 5 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 3.7.19.1

This SR is modified by a Note indicating that the isolation of safety chilled water flow to individual components may render these components inoperable but does not affect the OPERABILITY of safety chilled water system.

Verifying the correct alignment for manual valves servicing safety-related equipment provides assurance that the proper flow paths exist for Safety Chilled Water System operation. This SR 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 being locked, sealed, or secured. 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 judgement, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~

INSERT 3

SR 3.7.19.2

This SR verifies proper operation of the Safety Chilled Water System fans and pumps on an actual or simulated Safety Injection actuation signal. ~~Operating experience has shown that these components usually pass the surveillance when performed at the 18 month Frequency. Therefore, the 18 month frequency is acceptable from a reliability standpoint.~~

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.20.1

Verifying each require EFCU operates for ≥ 1 continuous hour ensures that they are OPERABLE~~.~~ INSERT 3

~~SR 3.7.20.2~~

Verifying each UPS A/C train operates for ≥ 1 hour ensures that they are OPERABLE and that all associated controls are functioning properly. INSERT 3

SR 3.7.20.3

This SR verifies that the each UPS A/C train starts and operates on an actual or simulated Safety Injection actuation signal and on an actual or simulated Blackout actuation signal. INSERT 3 ~~The 18 month frequency is consistent with the typical refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

REFERENCES

1. FSAR, Section 9.4C.8.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SR for demonstrating the OPERABILITY of the DGs are consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), and Regulatory Guide 1.137 (Ref. 10).

Where the SR discussed herein specify voltage and frequency tolerances, the following is applicable.

The minimum steady state output voltage of 6480 V allows for voltage drops to motors and other equipment down to the 120 V level to ensure that the loads will not experience voltage less than the minimum rated voltage. The maximum steady state output voltage of 7150 V ensures that, under lightly loaded conditions, motors and other equipment down to the 120 V level will not experience voltages more than the maximum rated voltage. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1 INSERT 3

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. ~~The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room~~.

SR 3.8.1.2 and SR 3.8.1.7

These SR help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SR are modified by a Note (Note 2 for

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period. In addition, for SR 3.8.1.2, following prelube, a warmup period is allowed prior to loading.

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. For SR 3.8.1.2 and SR 3.8.1.7 testing, the diesel should be started from ambient conditions which means the diesel engine is cold or at a temperature consistent with manufacturer's recommendations.

The DG shall start using one of the following signals: 1) Manual, 2) Simulated or actual safeguards bus undervoltage, 3) Safety Injection simulated or actual signal in conjunction with a simulated or actual loss of offsite power signal, or 4) a Safety Injection simulated or actual signal by itself.

For SR 3.8.1.2, in order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 3.

SR 3.8.1.7 requires that~~, at a 184 day Frequency,~~ the DG starts from standby conditions, accelerates to 441 RPM, and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR, Chapter 15 (Ref. 5).

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 3) when a modified start procedure as described above is used. If a modified start is not used, the 10 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

In addition to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

~~The 31 day Frequency for SR 3.8.1.2, is consistent with Regulatory Guide 1.9 (Ref. 3) and Generic Letter 94-01 (Ref. 14). The 184 day Frequency for SR 3.8.1.7 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.~~

INSERT 3

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. 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 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The 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.

~~The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3) and Generic Letter 94-01 (Ref. 14).~~

This SR is modified by four Notes. Note 1 indicates 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 states that momentary transients, because of changing bus loads, do not invalidate this 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.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the required level. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil for a minimum of 1 hour of DG operation at full load plus 10% (562 gallons) plus 878 gallons which is credited in TS 3.8.3 in meeting the 7 day fuel oil storage requirement.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.4 (continued)

~~The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and facility operators would be aware of any large uses of fuel oil during this period.~~

SR 3.8.1.5

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. Removal of water from the fuel oil day 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 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. 10). This SR is for preventative maintenance.~~ The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

INSERT 3

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank. This 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 frequency of 92 days is adequate to verify proper automatic operation of the fuel transfer pumps to maintain the required volume of fuel oil in the day tanks. This frequency corresponds to the testing requirements for pumps as contained in the ASME Code (Ref. 11).~~

SR 3.8.1.7

See SR 3.8.1.2.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

INSERT 3

SR 3.8.1.8

Transfer of each 6.9 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. ~~The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The single largest motor load on the bus at any given time is the Component Cooling Water pump load which has a name plate rating of 783 KW. This Surveillance may be accomplished by:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

a. Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power, or while solely supplying the bus; or

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by IEEE-308 (Ref. 12), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

INSERT 3

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b is a steady state voltage value to which the system must recover following load rejection. ~~The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9).~~

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABIITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

INSERT 3

The 18 month Frequency is consistent with the recom~~mendation of~~ Regulatory Guide 1.9 (Ref.3) ~~and is intended~~ to be consistent with expected fuel cycle ~~lengths.~~

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref.3), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all safety functions encountered from the loss of offsite power, including shedding of the nonessential loads, energization of the emergency buses in ≤ 10 seconds after auto-start signal, and energization of the respective loads from the DG. It further demonstrates the capability of the DG to automatically maintain the required steady state voltage and frequency.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems 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.

INSERT 3

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref.3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by two Notes. The reason for Note 1 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. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts, achieves and maintains the required voltage and frequency within the specified time (10 seconds) from the safety injection signal and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability.

~~The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

This SR is modified by a Note. The reason for Note 1 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. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start.

INSERT 3

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a DG emergency start which occurs from either a loss of voltage or an SI actuation test signal. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

~~The 18 month Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.14

Regulatory Guide 1.9 (Ref.3), requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 2 hours of which is at a load equivalent to approximately 110% of the continuous duty rating and the remainder of the time at a load equivalent to 90% to 100% of the continuous duty rating of the DG. For the purposes of the 2 hour run, the minimum load is approximately 110% of the 6300 kW maximum design load in lieu of the 7000 kW continuous rating. The DG start for this Surveillance can be performed either from ambient or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

The 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.

~~The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref.3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~

This Surveillance is modified by a Note 1 which states that momentary transients due to changing bus loads do not invalidate this test.

INSERT 3

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. ~~The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref.3).~~

The generator voltage shall be between 6480 V and 7150 V and frequency shall be 60± 1.2 Hz within 10 seconds after the start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.9 (Ref. 3) this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

INSERT 3

The Frequency of 18 months is consistent with the ~~recommendations~~ of Regulatory Guide 1.108 (Ref. 9)~~, paragraph~~ 2.a.(6), and takes into consideration ~~unit~~ conditions required to perform the Surveillance.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a LOCA actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are consistent with IEEE-308 (Ref. 13).

The intent of the requirement to automatically energize the emergency loads with offsite power is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads 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.

INSERT 3

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref.3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.17 (continued)

as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.18

Under accident and loss of offsite power conditions loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The 10% load sequence time interval tolerance ensures 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 buses.

INSERT 3

The Frequency of 18 months is consistent with the recommen~~dations of~~ Regulatory Guide 1.108 (Ref. 9), paragra~~ph 2.a.(2), t~~akes into consideration unit conditions require~~d to perform th~~e Surveillance, and is intended to be cons~~istent with e~~xpected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an SI actuation signal. In lieu of actual demonstration of connection and loading of 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.

INSERT 3

The Frequency of 18 months takes into consideration unit ~~conditions~~ required to perform the Surveillance ~~and is intended~~ to be consistent with an expected ~~fuel cycle length~~ of 18 months.

This SR is modified by two Notes. The reason for Note 1 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. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start. The reason for Note 2 is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed (441 rpm) within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent ~~with the recommendations of Regulatory Guide 1.108 (Ref. 9).~~

INSERT 3

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start.

SR 3.8.1.21 and SR 3.8.1.22

These SRs ensure the proper functioning of the safety injection and blackout sequencers.

SR 3.8.1.21 applies to the blackout sequencer input undervoltage relays. ~~These relays are calibrated every 18 months.~~

SR 3.8.1.22 applies to the Solid State Safeguards Sequencers (both the Safety Injection Sequencer and the Blackout Sequencer) and is the performance of a TADOT. ~~This surveillance is performed every 31 days.~~

This SR is modified by two Notes. The first Note excludes verification of setpoints from the TADOT. The trip setpoints are verified by as part of the ESF Instrumentation. The second Note excludes actuation of final devices. Operation of the sequencer during power operations could disrupt normal operation and induce a plant transient.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1 (continued)

fuel 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.

SR 3.8.3.2

The Surveillance contains a note that states that it is required only when the engine has been in shutdown for > 10 hours. This allowance is required because the lube oil level drops when the engine is running and does not immediately return to static conditions.

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG based on an engine lube oil consumption rate of 1.5 gallon per hour. The lube oil inventory equivalent to a 7 day supply is 1.75" below the low static level requirement and is based on conservative DG consumption values. Implicit in this SR is the requirement to verify adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

INSERT 3

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 unit staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion, and when added to the tank existing volume will maintain the tank volume absolute specific gravity range of $\geq$ 0.8348 and $\leq$ 0.8927 at 60/60°F or an API gravity range of $\geq$ 27° and $\leq$ 38° at 60°F. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. Tests a through d are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests a through d to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.~~4~~ 3 (continued)

can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

Particulate concentrations should be determined in accordance with ASTM D2276-1978, Method A, or D5452-2000 (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. For those designs in which the total stored fuel oil volume is contained in two or more interconnected tanks, each tank must be considered and tested separately.

The Frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals.

SR 3.8.3.4

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. The receiver design requirements provide for a minimum of five engine start cycles without recharging. A start cycle is defined by the DG vendor, but usually is measured in terms of time (seconds of cranking) or engine cranking speed. The pressure specified in this SR is intended to reflect the lowest value at which one start can be accomplished.

INSERT 3

~~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.~~

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. 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, and 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.5 (continued)

INSERT 3

~~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.

REFERENCES

1. FSAR, Section 9.5.4.1.
2. Regulatory Guide 1.137.
3. ANSI N195-1976.
4. FSAR, Chapter 6.
5. FSAR, Chapter 15.
6. ASTM Standards: D4057-1981; D975-1981; D1298-1980; D4176-1982; D1796-1968; D1552-1979; D2622-1982; D4294-2003; D2276-1978, Method A, D5452-2000.
7. ASTM Standards, D975-1981, Table 1.

BASES

ACTIONS (continued)

D.1 and D.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 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 plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger supplies a continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer. The minimum established float voltage is 2.13 Vpc or 128 V at the battery terminals. This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years)~~. The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 8).~~ INSERT 3

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is recommended 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 duration ensures that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying 300 amps at the minimum established charger test voltage of 130 volts or greater for 8 hours. The ampere requirements are

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.2 (continued)

based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least 2 hours.

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest combined demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ 2 amps.

INSERT 3

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.3

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in FSAR Chapter 8 (Ref. 4).

INSERT 3

The Surveillance Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests, not to exceed 18 months.

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

Note 2 says to verify the requirement during MODES 3, 4, 5, 6 or with the core off-loaded. This note does not prohibit the application of LCO 3.0.5 or the performance of this SR to restore equipment operability. Note 2 neither approves nor prohibits testing in MODES 1 and 2; however, for testing that is performed in MODES 1 and 2 (e.g., for post work testing) the testing may not

(continued)

BASES

ACTIONS

E.1 (continued)

specified for battery parameters on non-redundant batteries not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one train within 2 hours.

F.1

With one or more batteries with any battery parameter, outside the allowances of the Required Actions for Condition A, B, C, D, or E sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding DC battery must be declared inoperable. Additionally, discovering one or more batteries in one train with one or more battery cells float voltage less than 2.07 V and float current greater than 2 amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 4). ~~The 7 day Frequency is consistent with IEEE-450 (Ref. 4).~~

INSERT 3

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained the Required Actions of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of 2 amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained.

SR 3.8.6.2 and SR 3.8.6.5

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 132 V for 60 cells at the battery terminals, or 2.20 Vpc. This provides adequate over-

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.2 and SR 3.8.6.5 (continued)

potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. The minimum float voltage required by the battery manufacturer is 2.13 Vpc which corresponds to 128 V for 60 cells at the battery terminals. Float voltages in the range of less than 2.13 Vpc, but greater than 2.07 Vpc, are addressed in Specification 5.5.19. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of 2.07 V. ~~The Frequency for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. 4).~~

SR 3.8.6.3

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. ~~The Frequency is consistent with IEEE-450 (Ref. 4).~~

INSERT 3

SR 3.8.6.4

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., 70°F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. ~~The Frequency is consistent with IEEE-450 (Ref. 4).~~

SR 3.8.6.6

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.

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.6.6; however, only the modified performance discharge test may be used to satisfy the battery service test requirements of SR 3.8.4.3.

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load. This will confirm the battery's ability to meet the critical period of the load duty cycle, in addition to

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.6 (continued)

determining its percentage of rated capacity. Initial conditions for the modified performance discharge test will be identical to those specified for a service test and the test discharge rate will envelope the duty cycle of the service test if the modified performance discharge test is performed in lieu of a service test.

It may consist of just two rates; for instance 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 of which envelope the duty cycle of the service test. Since the ampere-hours removed by a rated one 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 must 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.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 4) and IEEE-485 (Ref. 5). 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. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

INSERT 3

~~The Surveillance Frequency for this test is normally 60 months~~. 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 18 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. 4), when the battery capacity drops by more than 10% from its capacity of the previous performance test, or is below 90% of the manufacturer's rating. This frequency is consistent with the recommendations in IEEE-450 (Ref. 4).

This SR is modified by a Note. This Note says to verify the requirement during MODES 3, 4, 5, 6 or with the core off-loaded. This note does not prohibit the application of LCO 3.0.5 or the performance of this SR to restore equipment operability. The Note neither approves nor prohibits testing in MODES 1 and 2; however, for testing that is performed in MODES 1 and 2 (e.g., for post work testing) the testing may not be credited to satisfy the SR.

(continued)

BASES (continued)

ACTIONS

A.1

With a required inverter inoperable, its associated AC vital bus becomes inoperable until it is re-energized by an operable inverter or the alternate bypass power supply from the Class 1E transformers.

For this reason a Note has been included in Condition A requiring the entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating." This ensures that the vital bus is re-energized within 2 hours.

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the AC vital bus is powered from its Class 1E transformer, it is relying upon non-regulating interruptible AC electrical power sources (offsite and onsite). Because of the potential impact of interrupted power on the Emergency Diesel Generator and the Solid State Safeguards Blackout Sequencer during a postulated Loss of Offsite Power event, these components are considered inoperable when operating on inverter bypass power, and evaluated under the SFDP of Specification 5.5.15. The uninterruptible inverter source to the AC vital buses is the preferred source for powering instrumentation trip setpoint devices.

B.1 and B.2

If the inoperable devices or components cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 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 plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is available for the instrumentation of the RPS and ESFAS connected to the AC vital buses. ~~The 7 day Frequency takes into account the~~

INSERT 3

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1 (continued)

~~redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions~~.

REFERENCES

1. FSAR, Chapter 8.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

immediately initiate action to restore the required inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is available for the instrumentation connected to the AC vital buses. The 7 day Frequency takes into account the redundant ~~capability of the~~ inverters and other indications ~~available in~~ the control room that alert the operator ~~to inverter~~ malfunctions.

INSERT 3

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.

BASES

ACTIONS (continued)

D.1 and D.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 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 plant systems.

E.1

Condition E corresponds to inoperable distribution subsystems that result in a loss of safety function, adequate core cooling, containment OPERABILITY and other vital functions for DBA mitigation would be compromised, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required AC, DC, and AC vital bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage 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 AC, DC, and AC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~

INSERT 3

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1 (continued)

INSERT 3

control functions for critical system loads connected to these buses. ~~The 7 day Frequency takes into account the capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1 (continued)

The boron concentration of the coolant in each volume is determined periodically by chemical analysis.

INSERT 3

~~A minimum Frequency of once every 72 hours is a reasonable amount of time to verify the boron concentration of representative samples. The Frequency is based on operating experience, which has shown 72 hours to be adequate.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Chapter 15.
3. NRC letter (W. Reckley to N. Carns) dated November 22, 1993: "Wolf Creek Generating Station - Positive Reactivity Addition; Technical Specification Bases Changes"

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1 (continued)

INSERT 3

that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked every 72 hours during MODE 6 under SR 3.9.1.1. This Surveillance demonstrates that the valves are closed through a system walkdown (which may include the use of local or remote indicators). ~~The 31 day Frequency is based on engineering judgment and is considered reasonable in view of other administrative controls that will ensure that the valve opening is an unlikely possibility.~~

REFERENCES

1. FSAR, Section 15.

2. NUREG-0800, Section 15.4.6.

BASES

ACTIONS (continued)

B.1

With no required source range neutron flux monitor OPERABLE, action to restore a monitor to OPERABLE status shall be initiated immediately. Once initiated, action shall be continued until a source range neutron flux monitor is restored to OPERABLE status.

B.2

With no required source range neutron flux monitor OPERABLE, there are no direct means of detecting changes in core reactivity. However, since CORE ALTERATIONS and boron concentration changes inconsistent with Required Action A.2 are not to be made, the core reactivity condition is stabilized until the source range neutron flux monitors are OPERABLE. This stabilized condition is determined by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

The Completion Time of once per 12 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration and ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

SR 3.9.3.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions.

The Frequency of 12 hours is consistent ~~with the CHANNEL CHECK Frequency specified~~ similarly for the same instruments in LCO 3.3.1.

INSERT 3

SR 3.9.3.2

SR 3.9.3.2 is the performance of a CHANNEL CALIBRATION ~~every 18 months~~. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. For the source range neutron detectors, performance data is obtained and evaluated. ~~The 18 month~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.3.2 (continued)

Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 13, GDC 26, GDC 28, and GDC 29.
2. FSAR, Section [15.2.4].
3. NRC letter (W. Reckley to N. Carns) dated November 22, 1993 "Wolf Creek Generating Station - Positive Reactivity Addition; Technical Specification Bases Changes".

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. The Surveillance on the open isolation valves will demonstrate that the required valves are not blocked from closing. Also the Surveillance will demonstrate that each valve operator has motive power, which will ensure that each required valve is capable of being closed by an OPERABLE automatic containment ventilation isolation signal.

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. The Surveillance interval is selected to be commensurate with the normal duration of time to complete fuel handling operations. A surveillance before the start of refueling operations will provide two or three surveillance verifications during the applicable period for this LCO. As such, this Surveillance ensures that a postulated fuel handling accident that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the environment.

SR 3.4.9.2

This Surveillance demonstrates that the necessary hardware, tools, and equipment are available to install the equipment hatch. The equipment hatch is provided with a set of hardware, tools, and equipment for moving the hatch from its storage location and installing it in the opening. The required set of hardware, tools, and equipment shall be inspected to ensure that they can perform the required functions.

INSERT 3

The Surveillance is performed ~~every 7 days~~ during CORE ALTERATIONS or movement of irradiated fuel assemblies within the containment. ~~The Surveillance interval is selected to be commensurate with the normal duration of time to complete the fuel handling operations~~. The Surveillance is modified by a Note which only requires that the Surveillance be met for an open equipment hatch. If the equipment hatch is installed in its opening, the availability of the means to install the hatch is not required. ~~The 7 day Frequency is adequate considering that the hardware, tools, and equipment are dedicated to the equipment hatch and not used for any other function.~~

SR 3.9.4.3

This Surveillance demonstrates that each required containment ventilation valve actuates to its isolation position on manual initiation or on an actual or simulated high radiation signal from a containment atmosphere gaseous

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.4.3 (continued)

INSERT 3

monitoring instrumentation channel. ~~The 18 month Frequency maintains~~ consistency with other similar instrumentation and valve testing requirements. In LCO 3.3.6, the Containment Ventilation Isolation instrumentation requires a CHANNEL CHECK every 12 hours and a COT every 92 days to ensure the channel OPERABILITY during refueling operations. Every 18 months a CHANNEL CALIBRATION is performed. These Surveillances performed during MODE 6 will ensure that the valves are capable of closing after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

REFERENCES

1. FSAR, Section 15.7.4.
2. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.
3. NUREG-0797, Section 15.4.8, Supplement 22, January 1990.
4. Technical Requirements Manual

BASES

ACTIONS

A.3 (continued)

6 and the refueling water level ≥ 23 ft above the top of the reactor vessel flange, corrective actions shall be initiated immediately.

A.4

If RHR loop requirements are not met, all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere must be closed within 4 hours. With the RHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Closing containment penetrations that are open to the outside atmosphere ensures dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 INSERT 3

This Surveillance demonstrates that the RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator in the control room for monitoring the RHR System.~~

REFERENCES

1. FSAR, Section 5.4.7.

BASES

ACTIONS

B.3 (continued)

closed within 4 hours. With the RHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Closing containment penetrations that are open to the outside atmosphere ensures that dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

This Surveillance demonstrates that one RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. In addition, during operation of the RHR loop with the water level in the vicinity of the reactor vessel nozzles, the RHR pump suction requirements must be met. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator for monitoring the RHR System in the control room.~~

INSERT 3

SR 3.9.6.2

Verification that the required pump is OPERABLE ensures that an additional RHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~

REFERENCES

1. FSAR, Section 5.4.7.

BASES (continued)

APPLICABILITY

LCO 3.9.7 is applicable when moving irradiated fuel assemblies within containment. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel assemblies are not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.15, "Fuel Storage Pool Water Level."

ACTIONS

A.1

With a water level of < 23 ft above the top of the reactor vessel flange, all operations involving movement of irradiated fuel assemblies within the containment shall be suspended immediately to ensure that a fuel handling accident cannot occur.

The suspension of fuel movement shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the analysis of the postulated fuel handling accident during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a fuel handling accident inside containment (Ref. 2).

INSERT 3

~~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 of valve positions, which make significant unplanned level changes unlikely.~~

REFERENCES

1. Regulatory Guide 1.195, May 2003.
2. FSAR, Section 15.7.4
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.10.

(continued)

ATTACHMENT 5 to TXX-11093

RETYPED TECHNICAL SPECIFICATION PAGES

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	3.1-5	3.3-24	3.4-3	3.4-36	3.7-18	3.8-8
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	3.2-9	3.3-38	3.4-17	3.5-6	3.7-32	3.8-32
	3.2-10	3.3-39	3.4-18	3.5-7	3.7-33	3.8-34
	3.2-13	3.3-40	3.4-19	3.5-8	3.7-34	3.8-36
	3.3-8	3.3-41	3.4-20	3.5-9	3.7-35	3.8-38
	3.3-9	3.3-42	3.4-21	3.5-10	3.7-36	3.8-40
	3.3-10	3.3-43	3.4-22	3.5-11	3.7-37	3.9-1
	3.3-11	3.3-44	3.4-23	3.6-6	3.7-38	3.9-3
	3.3-12	3.3-45	3.4-24	3.6-12	3.7-39	3.9-5
	3.3-13	3.3-46	3.4-25	3.6-13	3.7-40	3.9-7
	3.3-14	3.3-47	3.4-26	3.6-14	3.7-41	3.9-9
	3.3-15	3.3-48	3.4-27	3.6-15	3.7-42	3.9-11
	3.3-16	3.3-49	3.4-28	3.6-16	3.7-43	3.9-12
	3.3-17	3.3-50	3.4-29	3.6-17	3.7-44	5-5-17
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3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 SDM shall be within the limits provided in the COLR.

APPLICABILITY: MODE 2 with $k_{eff} < 1.0$,
MODES 3, 4, and 5

--NOTE--
While this LCO is not met, entry into MODE 5 from MODE 6 is not permitted.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM to be within limits.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	-----NOTE----- The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. ---------- Verify measured core reactivity is within ± 1% Δk/k of predicted values.	Once prior to entering MODE 1 after each refueling <u>AND</u> -----NOTE----- Only required after 60 EFPD ---------- In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Verify MTC is within upper limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	-------------------NOTES------------------- 1. Not required to be performed until 7 effective full power days (EFPD) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. 2. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle. 3. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of ≤ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR. --- Verify MTC is within lower limit.	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3.	6 hours
D. More than one rod not within alignment limit.	D.1.1 Verify SDM to be within the limits provided in the COLR. OR D.1.2 Initiate boration to restore required SDM to within limit. AND D.2 Be in MODE 3.	1 hour 1 hour 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	In accordance with the Surveillance Frequency Control Program.
SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is $\leq$ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. $T_{avg} \geq 500°F$; and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

LCO 3.1.5 Each shutdown bank shall be within insertion limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 with any control bank not fully inserted.

---NOTE---
This LCO is not applicable while performing SR 3.1.4.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown banks not within limits.	A.1.1 Verify SDM to be within the limits provided in the COLR. <u>OR</u> A.1.2 Initiate boration to restore SDM to within limit. <u>AND</u> A.2 Restore shutdown banks to within limits.	1 hour 1 hour 2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Bank Insertion Limits

LCO 3.1.6 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 with $k_{eff} \geq 1.0$.

-----NOTE-----
This LCO is not applicable while performing SR 3.1.4.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control bank insertion limits not met.	A.1.1 Verify SDM to be within the limits provided in the COLR.	1 hour
	OR	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	
	A.2 Restore control bank(s) to within limits.	2 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Control bank sequence or overlap limits not met.	B.1.1 Verify SDM to be within the limits provided in the COLR.	1 hour
	<u>OR</u>	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	B.2 Restore control bank sequence and overlap to within limits.	2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.2	Verify each control bank insertion is within the limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program.
SR 3.1.6.3	Verify sequence and overlap limits specified in the COLR are met for control banks not fully withdrawn from the core.	In accordance with the Surveillance Frequency Control Program.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

LCO 3.1.7 The Digital Rod Position Indication (DRPI) System and the Demand Position Indication System shall be OPERABLE

APPLICABILITY: MODES 1 and 2.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each inoperable rod position indicator and each demand position indicator per bank.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DRPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable position indicators indirectly by using core power distribution measurement information.	Once per 8 hours
	OR	
	A.2 Reduce THERMAL POWER to ≤ 50% RTP.	8 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. More than one DRPI per group inoperable.	B.1 Place the control rods under manual control.	Immediately
	AND	
	B.2 Monitor and record RCS T_{avg}.	Once per 1 hour
	AND	
	B.3 Verify the position of the rods with inoperable position indicators indirectly by using core power distribution measurement information.	Once per 8 hours
	AND	
	B.4 Restore inoperable position indicators to OPERABLE status such that a maximum of one DRPI per group is inoperable.	24 hours
C. One or more rods with inoperable DRPIs have been moved in excess of 24 steps in one direction since the last determination of the rod's position.	C.1 Verify the position of the rods with inoperable position indicators indirectly by using core power distribution measurement information.	4 hours
	OR	
	C.2 Reduce THERMAL POWER to $\leq$ 50% RTP.	8 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One demand position indicator per bank inoperable for one or more banks.	D.1.1 Verify by administrative means all DRPIs for the affected banks are OPERABLE.	Once per 8 hours
	<u>AND</u>	
	D.1.2 Verify the most withdrawn rod and the least withdrawn rod of the affected banks are ≤ 12 steps apart.	Once per 8 hours
	<u>OR</u>	
	D.2 Reduce THERMAL POWER to ≤ 50% RTP.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify each DRPI agrees within 12 steps of the group demand position for the full indicated range of rod travel.	Once prior to criticality after each removal of the reactor vessel head.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 PHYSICS TESTS Exceptions - MODE 2

LCO 3.1.8 During the performance of PHYSICS TESTS, the requirements of

LCO 3.1.3, "Moderator Temperature Coefficient (MTC)";
LCO 3.1.4, "Rod Group Alignment Limits";
LCO 3.1.5, "Shutdown Bank Insertion Limits";
LCO 3.1.6, "Control Bank Insertion Limits"; and
LCO 3.4.2, "RCS Minimum Temperature for Criticality"

may be suspended, provided:

a. RCS lowest operating loop average temperature is ≥ 541°F; and

b. SDM is within the limits provided in the COLR; and

c. THERMAL POWER is ≤ 5% RTP

APPLICABILITY: MODE 2 during PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit. AND A.2 Suspend PHYSICS TESTS exceptions.	15 minutes 1 hour
B. THERMAL POWER not within limit.	B.1 Open reactor trip breakers.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. RCS lowest operating loop average temperature not within limit.	C.1 Restore RCS lowest operating loop average temperature to within limit.	15 minutes
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform a CHANNEL OPERATIONAL TEST on power range and intermediate range channels per SR 3.3.1.7, SR 3.3.1.8, and Table 3.3.1-1.	Prior to initiation of PHYSICS TESTS
SR 3.1.8.2	Verify the RCS lowest operating loop average temperature is ≥ 541°F.	In accordance with the Surveillance Frequency Control Program.
SR 3.1.8.3	Verify THERMAL POWER is ≤ 5% RTP.	In accordance with the Surveillance Frequency Control Program.
SR 3.1.8.4	Verify SDM is within the limits provided in the COLR.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

---NOTE---
During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved at which a power distribution measurement is obtained.

	SURVEILLANCE	FREQUENCY
SR 3.2.1.1	Verify $F_Q^C(Z)$ is within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 20% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified <u>AND</u> In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 20% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified <u>AND</u> In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

-----NOTE-----
During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved at which a power distribution measurement is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify $F^N_{\Delta H}$ is within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program.

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)

LCO 3.2.3 The AFD in % flux difference units shall be maintained within the limits specified in the COLR.

---NOTE---
The AFD shall be considered outside limits when two or more OPERABLE excore channels indicate AFD to be outside limits.

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AFD not within limits.	A.1 Restore THERMAL POWER to < 50% RTP.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD is within limits for each OPERABLE excore channel.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.4.1	-----NOTES----- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. ----- Verify QPTR is within limit by calculation.	In accordance with the Surveillance Frequency Control Program.
SR 3.2.4.2	-----NOTE----- Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP. ----- Verify QPTR is within limit using the core power distribution measurement information.	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
T. One or more required channel(s) inoperable.	T.1 Verify interlock is in required state for existing unit conditions. <u>OR</u> T.2 Be in MODE 2.	1 hour 7 hours
U. One trip mechanism inoperable for one RTB.	U.1 Restore inoperable trip mechanism to OPERABLE status. <u>OR</u> U.2 Be in MODE 3.	48 hours 54 hours
V. Not used.		

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2	-------------------------------NOTE------------------------------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. -- Compare results of calorimetric heat balance calculation to NIS Power Range channel and N-16 Power Monitor channel outputs. Adjust NIS Power Range channel outputs if calorimetric heat balance calculation exceeds NIS Power Range channel outputs by more than +2% RTP. Adjust N-16 Power Monitor channel outputs if calorimetric heat balance calculation exceeds N-16 Power Monitor channel outputs by more than +2% RTP.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.3	-------------------------------NOTE------------------------------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. -- Compare results of the core power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 3%.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.4	-------------------------------NOTE------------------------------- This Surveillance must be performed on the reactor trip bypass breaker for the local manual shunt trip only prior to placing the bypass breaker in service. -- Perform TADOT.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.6	-----NOTE----- Not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER $\geq$ 75% RTP. ---------- Calibrate excore channels to agree with core power distribution measurements.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.7	-----NOTES----- 1. Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. 2. Source range instrumentation shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8	---NOTE--- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. --- Perform COT.	---NOTE--- Only required when not performed within the previous Frequency specified in the SFCP. --- Prior to reactor startup AND 12 hours after reducing power below P-10 for power and intermediate instrumentation AND Four hours after reducing power below P-6 for source range instrumentation AND In accordance with the Surveillance Frequency Control Program thereafter

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.9	-----NOTE----- Verification of setpoint is not required. ---------- Perform TADOT.	 In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.10	-----NOTES----- 1. N-16 detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Prior to entry into MODES 2 or 1, N-16 detector plateau verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP. ---------- Perform CHANNEL CALIBRATION.	 In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.11	----------NOTES---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Prior to entry into MODES 2 or 1, power and intermediate range detector plateau verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP. ------------------------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.12	Not used.	
SR 3.3.1.13	Perform COT.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.1.14	----------NOTE---------- Verification of setpoint is not required. ------------------------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.15	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	Prior to exceeding the P-9 interlock whenever the unit has been in MODE 3, if not performed in the previous Frequency specified in the SFCP
SR 3.3.1.16	-----NOTE----- Neutron and N-16 detectors are excluded from response time testing. ----- Verify RTS RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.1-1 (page 1 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[(a)]
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA
	3[(b)], 4[(b)], 5[(b)]	2	C	SR 3.3.1.14	NA
2. Power Range Neutron Flux					
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 109.6% RTP[(q)(r)]
b. Low	1[(c)], 2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 25.6% RTP[(q)(r)]
3. Power Range Neutron Flux Rate High Positive Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 6.3% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1[(c)], 2[(d)]	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 31.5% RTP

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(c) Below the P-10 (Power Range Neutron Flux) interlock.
(d) Above the P-6 (Intermediate Range Neutron Flux) interlock.
(q) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
(r) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Nominal Trip Setpoint or a value that is more conservative than the Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoint, the methodology used to determine the as-found tolerance and the methodology used to determine the as-left tolerance shall be specified in the Technical Specification Bases.

Table 3.3.1-1 (page 2 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Source Range Neutron Flux	2[e]	2	I,J	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.4 E5 cps
	3[b], 4[b], 5[b]	2	J,K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.4 E5 cps
6. Overtemperature N-16	1,2	4	E	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	Refer to Note 1[q][r]
7. Overpower N-16	1,2	4	E	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 112.8% RTP [q][r]
8. Pressurizer Pressure					
a. Low	1[g]	4	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 1863.6 psig (Unit 1) ≥ 1865.2 psig (Unit 2)
b. High	1,2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 2400.8 psig (Unit 1) ≤ 2401.4 psig (Unit 2)

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(g) Above the P-7 (Low Power Reactor Trips Block) interlock.
(q) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
(r) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Nominal Trip Setpoint or a value that is more conservative than the Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoint, the methodology used to determine the as-found tolerance and the methodology used to determine the as-left tolerance shall be specified in the Technical Specification Bases.

Table 3.3.1-1 (page 3 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
9. Pressurizer Water Level - High	1[g]	3	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 93.9% of instrument span
10. Reactor Coolant Flow - Low	1[g]	3 per loop	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 88.6% of indicated loop flow (Unit 1) ≥ 88.8% of indicated loop flow (Unit 2)
11. Not Used					
12. Undervoltage RCPs	1[g]	1 per bus	M	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 4753 V
13. Underfrequency RCPs	1[g]	1 per bus	M	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 57.06 Hz
14. Steam Generator (SG) Water Level Low-Low [l]	1, 2	4 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 37.5% of narrow range instrument span (Unit 1) [q][r] ≥ 34.9% of narrow range instrument span (Unit 2)[q][r]
15. Not Used.					

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(g) Above the P-7 (Low Power Reactor Trips Block) interlock.
(l) The applicable MODES for these channels in Table 3.3.2-1 are more restrictive.
(q) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
(r) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Nominal Trip Setpoint, or a value that is more conservative than the Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoint, the methodology used to determine the as-found tolerance and the methodology used to determine the as-left tolerance shall be specified in the Technical Specification Bases.

Table 3.3.1-1 (page 4 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE(a)
16. Turbine Trip					
a. Low Fluid Oil Pressure	1(j)	3	O	SR 3.3.1.10 SR 3.3.1.15	≥ 46.6 psig
b. Turbine Stop Valve Closure	1(j)	4	P	SR 3.3.1.10 SR 3.3.1.15	≥ 1% open
17. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	Q	SR 3.3.1.14	NA
18. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2(e)	2	S	SR 3.3.1.11 SR 3.3.1.13	≥ 6E-11 amp
b. Low Power Reactor Trips Block, P-7	1	1 per train	T	SR 3.3.1.5	NA
c. Power Range Neutron Flux, P-8	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 50.7% RTP
d. Power Range Neutron Flux, P-9	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 52.7% RTP
e. Power Range Neutron Flux, P-10	1,2	4	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7.3% RTP and ≤ 12.7% RTP
f. Turbine First Stage Pressure, P-13	1	2	T	SR 3.3.1.10 SR 3.3.1.13	≤ 12.7% turbine power
19. Reactor Trip Breakers(RTBs)(k)	1,2	2 trains	R	SR 3.3.1.4	NA
	3(b), 4(b), 5(b)	2 trains	C	SR 3.3.1.4	NA

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) With Rod Contol System capable of rod withdrawal or one or more rods not fully inserted.
(e) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(j) Above the P-9 (Power Range Neutron Flux) interlock.
(k) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

Table 3.3.1-1 (page 5 of 6)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[(a)]
20. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms[(k)]	1,2	1 each per RTB	U	SR 3.3.1.4	NA
	3[(b)], 4[(b)], 5[(b)]	1 each per RTB	C	SR 3.3.1.4	NA
21. Automatic Trip Logic	1,2	2 trains	Q	SR 3.3.1.5	NA
	3[(b)], 4[(b)], 5[(b)]	2 trains	C	SR 3.3.1.5	NA

(a) The Allowable Value defines the limiting safety system setting except for Trip Functions 2a, 2b, 6, 7, and 14 (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.

(b) With Rod Contol System capable of rod withdrawal or one or more rods not fully inserted.

(k) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

Table 3.3.1-1 (page 6 of 6)
Reactor Trip System Instrumentation

Note 1: Overtemperature N-16

The Overtemperature N-16 Function Allowable Values shall not exceed the following setpoint by more than 0.5% N-16 span for N-16 input, 0.5% T_{cold} span for T_{cold} input, 0.5% pressure span for pressure input, and 0.5% Δq span for Δq input.

$$Q_{setpoint} = K_1 - K_2\left[\frac{(1+\tau_1 S)}{(1+\tau_2 S)}T_c - T_c^{\circ}\right] + K_3(P - P^1) - f_1(\Delta q)$$

Where:

$Q_{setpoint}$	=	Overtemperature N-16 trip setpoint
K_1	=	*
K_2	=	*/°F
K_3	=	*/psig
T_C	=	Measured cold leg temperature, °F
T_C°	=	Indicated reference T_C at RATED THERMAL POWER, *°F
P	=	Measured pressurizer pressure, psig
P^1	≥	* psig (Nominal RCS operating pressure)
s	=	the Laplace transform operator, sec^{-1}.
τ_1, τ_2	=	Time constants utilized in lead-lag controller for T_c, $\tau_1 \geq$ * sec, and $\tau_2 \leq$ * sec

$f_1(\Delta q)$ = *{(q_t - q_b) + *%} when (q_t - q_b) ≤ *% RTP
0% when *% RTP < (q_t - q_b) < *% RTP
*{(q_t - q_b) - *%} when (q_t - q_b) ≥ *% RTP

* as specified in the COLR

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1

ACTIONS

---NOTE---
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Be in MODE 5.	84 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One train inoperable.	-----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -----	
	C.1 Restore train to OPERABLE status.	24 hours
	OR	
	C.2.1 Be in MODE 3.	30 hours
	AND	
	C.2.2 Be in MODE 5.	60 hours
D. One channel inoperable.	-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing. -----	
	D.1 Place channel in trip.	72 hours
	OR	
	D.2.1 Be in MODE 3.	78 hours
	AND	
	D.2.2 Be in MODE 4.	84 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One Containment Pressure channel inoperable.	-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing. -----	
	E.1 Place channel in bypass.	72 hours
	<u>OR</u>	
	E.2.1 Be in MODE 3.	78 hours
	<u>AND</u>	
	E.2.2 Be in MODE 4.	84 hours
F. One channel or train inoperable.	F.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	F.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	F.2.2 Be in MODE 4.	60 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ------------------------	
	G.1 Restore train to OPERABLE status.	24 hours
	<u>OR</u>	
	G.2.1 Be in MODE 3.	30 hours
	<u>AND</u>	
	G.2.2 Be in MODE 4.	36 hours
H. One train inoperable.	----------NOTE---------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ------------------------	
	H.1 Restore train to OPERABLE status.	24 hours
	<u>OR</u>	
	H.2 Be in MODE 3.	30 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One channel inoperable.	---------------------NOTE--------------------- One channel may be bypassed for up to 12 hours for surveillance testing. --	
	I.1 Place channel in trip.	72 hours
	<u>OR</u>	
	I.2 Be in MODE 3.	78 hours
J. One Main Feedwater Pump trip channel inoperable.	J.1 Place channel in trip.	6 hours
	<u>OR</u>	
	J.2 Be in MODE 3.	12 hours
K. One channel inoperable.	---------------------NOTE--------------------- One channel may be bypassed for up to 12 hours for surveillance testing. --	
	K.1 Place channel in bypass.	72 hours
	<u>OR</u>	
	K.2.1 Be in MODE 3.	78 hours
	<u>AND</u>	
	K.2.2 Be in MODE 5.	108 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. One or more required channel(s) inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	<u>OR</u>	
	L.2.1 Be in MODE 3.	7 hours
	<u>AND</u>	
	L.2.2 Be in MODE 4.	13 hours

SURVEILLANCE REQUIREMENTS

-NOTE-
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.3	Not Used.	

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.4	Perform MASTER RELAY TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.5	Perform COT.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.6	Perform SLAVE RELAY TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.7	-----NOTES----- 1. Verification of relay setpoints not required. 2. Actuation of final devices not included. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.8	-----NOTE----- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.9	-----NOTE----- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	 In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.10	-----NOTE----- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 532 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	 In accordance with the Surveillance Frequency Control Program.
SR 3.3.2.11	-----NOTE----- Verification of setpoint not required. ---------- Perform TADOT.	 In accordance with the Surveillance Frequency Control Program.

Table 3.3.2-1 (page 1 of 6)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
1. Safety Injection					
a. Manual Initiation	1, 2, 3, 4	2	B	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Containment Pressure -- High 1	1, 2, 3	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 3.8 psig
d. Pressurizer Pressure -- Low	1, 2, 3[b]	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 1803.6 psig
e. Steam Line Pressure Low	1, 2, 3[b]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 594.0 psig[c] (Unit 1) ≥ 578.4 psig[c] (Unit 2)
2. Containment Spray					
a. Manual Initiation	1, 2, 3, 4	2 per train, 2 trains	B	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Containment Pressure High -- 3	1, 2, 3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.8 psig

(a) The Allowable Value defines the limiting safety system except for functions 5b and 6c (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) interlock and below P-11, unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $T_1 \geq 10$ seconds and $T_2 \leq 5$ seconds.

Table 3.3.2-1 (page 2 of 6)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1, 2, 3, 4	2	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
b. Phase B Isolation					
(1) Manual Initiation	1, 2, 3, 4	2 per train, 2 trains	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
(3) Containment Pressure High – 3	1, 2, 3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤ 18.8 psig

(a) The Allowable Value defines the limiting safety system except for functions 5b and 6c (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.

Table 3.3.2-1 (page 3 of 6)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[(a)]
4. Steam Line Isolation					
a. Manual Initiation	1, 2[(i)], 3[(i)]	2	F	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays	1, 2[(i)], 3[(i)]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Containment Pressure -- High 2	1, 2[(i)], 3[(i)]	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 6.8 psig
d. Steam Line Pressure					
(1) Low	1, 2[(i)], 3[(b)(i)]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 594.0 psig[(c)] (Unit 1) ≥ 578.4 psig[(c)] (Unit 2)
(2) Negative Rate -- High	3[(g)(i)]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 178.7 psi[(h)]

(a) The Allowable Value defines the limiting safety system except for functions 5b and 6c (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11, unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $T_1 \geq 10$ seconds and $T_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on steam line pressure-low is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) Except when all MSIVs and their associated upstream drip pot isolation valves are closed and deactivated.

Table 3.3.2-1 (page 4 of 6)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	1, 2[j]	2 trains	H	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
b. SG Water Level -- High High (P-14)	1, 2[j]	3 per SG[p]	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤84.5% of narrow range span (Unit 1) [q][r] ≤82.0% of narrow range span (Unit 2) [q][r]
c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				

(a) The Allowable Value defines the limiting safety system except for functions 5b and 6c (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.

(j) Except when all MFIVs and associated bypass valves are closed and de-activated or isolated by a closed manual valve.

(p) A channel selected for use as an input to the SG water level controller must be declared inoperable.

(q) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(r) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Nominal Trip Setpoint, or a value that is more conservative than the Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoint, the methodology used to determine the as-found tolerance and the methodology used to determine the as-left tolerance shall be specified in the Technical Specification Bases.

Table 3.3.2-1 (page 5 of 6)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE(a)
6. Auxiliary Feedwater					
a. Automatic Actuation Logic and Actuation Relays (Solid State Protection System)	1, 2, 3	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
b. Not Used.					
c. SG Water Level Low-Low	1, 2, 3	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥37.5% of narrow range span (Unit 1) (q)(r) ≥34.9% of narrow range span (Unit 2) (q)(r)
d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
e. Loss of Offsite Power	1, 2, 3	1 per train	F	SR 3.3.2.7 SR 3.3.2.9 SR 3.3.2.10	NA
f. Not Used.					
g. Trip of all Main Feedwater Pumps	1, 2	2 per AFW pump	J	SR 3.3.2.8	NA
h. Not Used.					

(a) The Allowable Value defines the limiting safety system except for functions 5b and 6c (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.

(q) If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined as-found acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

(r) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Nominal Trip Setpoint, or a value that is more conservative than the Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoint, the methodology used to determine the as-found tolerance and the methodology used to determine the as-left tolerance shall be specified in the Technical Specification Bases.

Table 3.3.2-1 (page 6 of 6)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE(a)
7. Automatic Switchover to Containment Sump					
a. Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
b. Refueling Water Storage Tank (RWST) Level - Low Low	1, 2, 3, 4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 31.9% instrument span
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1, 2, 3	1 per train, 2 trains	F	SR 3.3.2.11	NA
b. Pressurizer Pressure, P-11	1, 2, 3	3	L	SR 3.3.2.5 SR 3.3.2.9	≤ 1975.2 psig (Unit 1) ≤ 1976.4 psig (Unit 2)

(a) The Allowable Value defines the limiting safety system except for functions 5b and 6c (the Nominal Trip Setpoint defines the limiting safety system setting for these Trip Functions). See the Bases for the Nominal Trip Setpoints.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more Functions with two required channels inoperable. OR One required T_{hot} channel and one required Core Exit Temperature channel inoperable. OR One required T_{cold} channel and one required Steam Line Pressure channel for the associated loop inoperable.	C.1 Restore one channel to OPERABLE status.	7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3-1.	F.1 Initiate action in accordance with Specification 5.6.8.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----
SR 3.3.3.1 and SR 3.3.3.3 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.3.2	Deleted	
SR 3.3.3.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION E.1
1. Refueling Water Storage Tank Level	2	E
2. Subcooling Monitors	2	E
3. Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range) (T_{hot})	1 per loop	E
4. RCS Cold Leg Temperature (Wide Range) (T_{cold})	1 per loop	E
5. RCS Pressure (Wide Range)	2	E
6. Reactor Vessel Water Level	2[(a)]	F
7. Containment Sump Water Level (Wide Range)	2	E
8. Containment Pressure (Intermediate Range)	2	E
9. Steam Line Pressure	2 per steam line	E
10. Containment Area Radiation (High Range)	2	F
11. Deleted		
12. Pressurizer Water Level	2	E
13. Steam Generator Water Level (Narrow Range)	2 per steam generator	E
14. Condensate Storage Tank Level	2	E
15. Core Exit Temperature - Quadrant 1	2[(c)]	E
16. Core Exit Temperature - Quadrant 2	2[(c)]	E
17. Core Exit Temperature - Quadrant 3	2[(c)]	E
18. Core Exit Temperature - Quadrant 4	2[(c)]	E
19. Auxiliary Feedwater Flow		
a. AFW Flow	2 per steam generator	E
<u>OR</u>		
b. AFW Flow and Steam Generator Water Level (Wide Range)	1 each per steam generator	E

(a) A channel is eight sensors in a probe. A channel is OPERABLE if four or more sensors, one or more in the upper section and three or more in the lower section, are OPERABLE.

(b) Deleted

(c) A channel consists of two core exit thermocouples (CETs).

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System Functions in Table 3.3.4-1 and the required hot shutdown panel (HSP) controls shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function and required HSP control.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions inoperable. <u>OR</u> One or more required HSP controls inoperable.	A.1 Restore required Function and required HSP controls to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.4.2	Verify each required HSP power and control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.4.3	-------------------------------NOTE------------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---	
	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.4-1 (page 1 of 1)
Remote Shutdown System Functions

FUNCTION	REQUIRED CHANNELS
1. Neutron Flux Monitors	1
2. Pressurizer Pressure	1
3. RCS Hot Leg Temperature	1 per loop
4. RCS Cold Leg Temperature	1 per loop
5. Condensate Storage Tank Level	1
6. SG Pressure	1 per SG
7. SG Level	1 per SG
8. AFW Flow	1 per SG
9. Pressurizer Level	1
10. Charging Pump to CVCS Charging and RCP Seals Flow Indication	1

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 The Loss of Power Diesel Generator Start Instrumentation for each Function in Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

---NOTE---
Not applicable for 6.9 kV Preferred Offsite Source Undervoltage function when associated source breaker is open.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. -------------NOTE------------ Not applicable to Automatic Actuation Logic and Actuation Relays Function --------------------------------- One or more Functions with one channel per bus inoperable.	A.1 Place channel in trip.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two channels per bus for the Preferred offsite source bus undervoltage function inoperable.	B.1 Restore one channel per bus to OPERABLE status.	1 hour
	<u>OR</u>	
	B.2.1 Declare the Preferred offsite source inoperable.	1 hour
	<u>AND</u>	
	B.2.2 Open associated Preferred offsite source bus breaker.	6 hours
C. Two channels per bus for the Alternate offsite source bus undervoltage function inoperable.	C.1 Restore one channel per bus to OPERABLE status.	1 hour
	<u>OR</u>	
	C.2.1 Declare the Alternate offsite source inoperable.	1 hour
	<u>AND</u>	
	C.2.2 Open associated Alternate offsite source bus breaker.	6 hours
D. Two channels per bus for the 6.9 kV bus loss of voltage function inoperable.	D.1 Restore one channel per bus to OPERABLE status.	1 hour
	<u>OR</u>	
	D.2 Declare the affected A.C. emergency buses inoperable.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	E.1 Restore one channel per bus to OPERABLE status.	1 hour
	OR	
	E.2.1 Declare both offsite power source buses inoperable.	1 hour
	AND	
	E.2.2 Open offsite power source breakers to the associated buses.	6 hours
F. One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	F.1 Restore train(s) to OPERABLE status.	1 hour
G. Required Action and associated Completion Time not met.	G.1 Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	Perform ACTUATION LOGIC TEST.	Prior to entering MODE 4 when in MODE 5 for ≥ 72 hours and if not performed in the previous Frequency specified in the SFCP
SR 3.3.5.2	-----NOTE----- Setpoint verification is not applicable. ----- Perform TADOT.	Prior to entering MODE 4 when in MODE 5 for ≥ 72 hours and if not performed in the previous Frequency specified in the SFCP
SR 3.3.5.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.4	Verify LOP DG start ESF RESPONSE TIMES are within limits.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.5-1 (page 1 of 1)
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Automatic Actuation Logic and Actuation Relays	2 trains	3.3.5.1	NA
2. Preferred offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	≤ 5580 V and ≥ 5040 V
3. Alternate offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	≤ 5580 V and ≥ 5040 V
4. 6.9 kv Class 1E bus undervoltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≤ 2115 V
5. 6.9 kv Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≥ 6024 V
6. 480 V Class 1E bus low grid undervoltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≥ 439 V
7. 480 V Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≥ 439 V

3.3 INSTRUMENTATION

3.3.6 Containment Ventilation Isolation Instrumentation

LCO 3.3.6 The Containment Ventilation Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One radiation monitoring channel inoperable.	A.1 Restore the affected channel to OPERABLE status.	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. --------------NOTE-------------- Only applicable in MODE 1, 2, 3, or 4. ------------------------------------	----------------------NOTE---------------------- For Required Action and associated Completion Time of Condition A not met, the containment pressure relief valves may be opened in compliance with the gaseous effluent monitoring instrumentation requirements in Part I of the ODCM. --	
One or more Automatic Actuation Logic and Actuation Relays trains inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	B.1 Enter applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment ventilation isolation valves made inoperable by isolation instrumentation.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. -------------NOTE------------ Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ---------------------------------	---------------------NOTE---------------------- The containment pressure relief valves may be opened in compliance with the gaseous effluent monitoring instrumentation requirements in Part I of the ODCM. --	
Required Action and associated Completion Time for Condition A not met.	C.1 Place and maintain containment ventilation valves in closed position.	Immediately
	<u>OR</u>	
	C.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment ventilation isolation valves made inoperable by isolation instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Ventilation Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.2	Perform ACTUATION LOGIC TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.6.3	Perform MASTER RELAY TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.6.4	Perform COT.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.6.5	Perform SLAVE RELAY TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.6.6	Not Used.	
SR 3.3.6.7	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.6-1 (page 1 of 1)
Containment Ventilation Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1. Manual Initiation	1, 2, 3, 4	Refer to LCO 3.3.2 "ESFAS Instrumentation," Functions 2.a and 3.a.1, respectively for all initiation functions and requirements.		
2. Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4	2 trains	SR 3.3.6.2 SR 3.3.6.3 SR 3.3.6.5	NA
3. Containment Radiation				
a. Gaseous	1, 2, 3, 4, (b), (c)	1	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	(a)
4. Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) Must satisfy Gaseous Effluent Dose Rate Requirements in Part I of the ODCM.
(b) During CORE ALTERATIONS.
(c) During movement of irradiated fuel assemblies within containment.

3.3 INSTRUMENTATION

3.3.7 Control Room Emergency Filtration System (CREFS) Actuation Instrumentation

LCO 3.3.7 The CREFS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.7-1

ACTIONS

---NOTE---
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place the affected CREFS train(s) in emergency recirculation mode.	7 days
	<u>OR</u>	
	A.2 -------------------NOTE-------------------- Applicable only to Functions 3a and 3b. -- Secure the Control Room makeup air supply fan from the affected air intake.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more Functions with two channels or two trains inoperable.	B.1.1 Place one CREFS train in emergency recirculation mode.	Immediately
	AND	
	B.1.2 Enter applicable Conditions and Required Actions for one CREFS train made inoperable by inoperable CREFS actuation instrumentation	Immediately
	OR	
	B.2 ----------------NOTE----------------- Applicable only to Functions 3a and 3b. -- Secure the Control Room makeup air supply fan from the affected air intake.	Immediately
C. Required Action and associated Completion Time for Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3.	6 hours
	AND	
	C.2 Be in MODE 5.	36 hours
D. Required Action and associated Completion Time for Condition A or B not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.7-1 to determine which SRs apply for each CREFS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.7.2	Perform COT.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.7.3	Not Used.	
SR 3.3.7.4	Not Used.	
SR 3.3.7.5	Not Used.	
SR 3.3.7.6	-----NOTE----- Verification of setpoint is not required. --- Perform TADOT.	 In accordance with the Surveillance Frequency Control Program.
SR 3.3.7.7	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.7-1 (page 1 of 1)
CREFS Actuation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1. Manual Initiation	1, 2, 3, 4, 5, and 6, (a)	2 trains	SR 3.3.7.6	NA
2. Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4, 5, and 6, (a)	2 trains	SR 3.3.7.2	NA
3. Control Room Radiation				
a. Control Room Air North Intake	1, 2, 3, 4, 5, and 6, (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.7	1.4×10^{-4} µCi/ml
b. Control Room Air South Intake	1, 2, 3, 4, 5, and 6, (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.7	1.4×10^{-4} µCi/ml
4. Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.			

(a) During movement of irradiated fuel assemblies.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. --------------NOTE-------------- Only applicable prior to exceeding 85% RTP after a refueling outage. ------------------------------------ Measured RCS Flow not within limits.	B.1 Maintain THERMAL POWER less than 85% RTP.	Immediately
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is ≥ the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.1.2	Verify RCS average temperature is ≤ the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.1.3	Verify RCS total flow rate is ≥ 389,700 and ≥ the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.1.4	-----NOTE----- Not required to be performed until after exceeding 85% RTP after each refueling outage. ---------- Verify by precision heat balance that RCS total flow rate is ≥ 389,700 and ≥ the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each operating RCS loop average temperature (T_{avg}) shall be ≥ 551°F.

APPLICABILITY: MODE 1,
MODE 2 with k_{eff} ≥ 1.0

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. T_{avg} in one or more operating RCS loops not within limit.	A.1 Be in MODE 2 with k_{eff} < 1.0.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify RCS T_{avg} in each operating loop ≥ 551°F.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 RCS Pressure and Temperature (P/T) Limits

LCO 3.4.3 RCS pressure, RCS temperature, and RCS heatup and cooldown rates shall be maintained within the limits specified in the PTLR.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------------NOTE------------- Required Action A.2 shall be completed whenever this Condition is entered. ----------------------------------- Requirements of LCO not met in MODE 1, 2, 3, or 4.	A.1 Restore parameter(s) to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5 with RCS pressure < 500 psig.	6 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. --------------NOTE------------- Required Action C.2 shall be completed whenever this Condition is entered. ------------------------------------		
Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limits.	Immediately
	AND	
	C.2 Determine RCS is acceptable for continued operation.	Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	---------------------------------NOTE--------------------------------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---	
	Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops -- MODES 1 and 2

LCO 3.4.4 Four RCS loops shall be OPERABLE and in operation.

APPLICABILITY: MODES 1 and 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify each RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops -- MODE 3

LCO 3.4.5 Two RCS loops shall be OPERABLE, and either:

a. Two RCS loops shall be in operation when the Rod Control System is capable of rod withdrawal; or

b. One RCS loop shall be in operation when the Rod Control System is not capable of rod withdrawal.

--NOTE--
All reactor coolant pumps may be removed from operation for ≤ 1 hour per 8 hour period provided:

a. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and

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

APPLICABILITY: MODE 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RCS loop inoperable.	A.1 Restore required RCS loop to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 4.	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One required RCS loop not in operation, with Rod Control System capable of rod withdrawal.	C.1 Restore required RCS loop to operation. OR C.2 Place the Rod Control System in a condition incapable of rod withdrawal.	1 hour 1 hour
D. Four RCS loops inoperable. OR No RCS loop in operation.	D.1 Place the Rod Control System in a condition incapable of rod withdrawal. AND D.2 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1. AND D.3 Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	Verify steam generator secondary side water levels are ≥ 38% (Unit 1) and ≥ 10% (Unit 2) for required RCS loops.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops -- MODE 4

LCO 3.4.6 Two loops consisting of any combination of RCS loops and residual heat removal (RHR) loops shall be OPERABLE, and one loop shall be in operation.

---NOTES---

1. All reactor coolant pumps (RCPs) and RHR pumps may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and

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

2. No RCP shall be started with any RCS cold leg temperature ≤ 350°F unless the secondary side water temperature of each steam generator (SG) is ≤ 50°F above each of the RCS cold leg temperatures.

APPLICABILITY: MODE 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required loop inoperable.	A.1 Initiate action to restore a second loop to OPERABLE status. AND A.2 -----------------NOTE----------------- Only required if one RHR loop is OPERABLE --- Be in MODE 5.	Immediately 24 hours

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RHR or RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.6.2	Verify SG secondary side water levels are ≥38% (Unit 1) and ≥10% (Unit 2) for required RCS loops.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.6.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops -- MODE 5, Loops Filled

LCO 3.4.7

One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

a. One additional RHR loop shall be OPERABLE; or

b. The secondary side water level of at least two steam generators (SGs) shall be $\geq$38% (Unit 1) and $\geq$10% (Unit 2).

------------------------------NOTES------------------------------

1. The RHR pump of the loop in operation may be removed from operation for $\leq$ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and

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

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

3. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq$ 350°F unless the secondary side water temperature of each SG is $\leq$ 50°F above each of the RCS cold leg temperatures.

4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

APPLICABILITY: MODE 5 with RCS loops filled

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.7.2	Verify SG secondary side water level is ≥38% (Unit 1) and ≥10% (Unit 2) in required SGs.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops -- MODE 5, Loops Not Filled

LCO 3.4.8

Two residual heat removal (RHR) loops shall be OPERABLE and one RHR loop shall be in operation.

--NOTES--

1. All RHR pumps may be removed from operation for ≤ 1 hour provided:

   a. The core outlet temperature is maintained at least 10°F below saturation temperature.

   b. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and

   c. No draining operations to further reduce the RCS water volume are permitted.

2. One RHR loop may be inoperable for ≤ 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

APPLICABILITY:

MODE 5 with RCS loops not filled

--NOTE--

While this LCO is not met, entry into MODE 5, Loops Not Filled from MODE 5, Loops filled is not permitted.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.8.2	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

LCO 3.4.9 The pressurizer shall be OPERABLE with:

a. Pressurizer water level ≤ 92%; and

b. Two groups of pressurizer heaters OPERABLE with the capacity of each group ≥ 150 kW.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Be in MODE 3.	6 hours
	AND	
	A.2 Fully insert all rods.	6 hours
	AND	
	A.3 Place Rod Control System in a condition incapable of rod withdrawal.	6 hours
	AND	
	A.4 Be in MODE 4.	12 hours
B. One required group of pressurizer heaters inoperable.	B.1 Restore required group of pressurizer heaters to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≤ 92%.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters is ≥ 150 kW.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Three pressurizer safety valves shall be OPERABLE with lift settings ≥ 2410 psig and ≤ 2485 psig.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures > 320°F

-----NOTE-----
The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 54 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. OR Two or more pressurizer safety valves inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with any RCS cold leg temperatures ≤ 320°F.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within ± 1%.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power Operated Relief Valves (PORVs)

LCO 3.4.11 Each PORV and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each PORV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more PORVs inoperable and capable of being manually cycled.	A.1 Close and maintain power to associated block valve.	1 hour
B. One PORV inoperable and not capable of being manually cycled.	B.1 Close associated block valve.	1 hour
	AND	
	B.2 Remove power from associated block valve.	1 hour
	AND	
	B.3 Restore PORV to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One block valve inoperable.	----------------------NOTE---------------------- Required Actions do not apply when block valve is inoperable solely as a result of complying with Required Actions B.2 or E.2. ---	
	C.1 Place associated PORV in manual control.	1 hour
	AND	
	C.2 Restore block valve to OPERABLE status.	72 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 4	12 hours
E. Two PORVs inoperable and not capable of being manually cycled.	E.1 Close associated block valves.	1 hour
	AND	
	E.2 Remove power from associated block valves.	1 hour
	AND	
	E.3 Be in MODE 3	6 hours
	AND	
	E.4 Be in MODE 4	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. More than one block valve inoperable.	----------NOTE---------- Required Actions do not apply when block valve is inoperable solely as a result of complying with Required Actions B.2 or E.2. ------------------------	
	F.1 Place associated PORVs in manual control.	1 hour
	AND	
	F.2 Restore one block valve to OPERABLE status	2 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1 Be in MODE 3.	6 hours
	AND	
	G.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	----------NOTES---------- 1. Not required to be performed with block valve closed in accordance with the Required Action of this LCO. 2. Not required to be performed prior to entry into MODE 3. ------------------------	
	Perform a complete cycle of each block valve.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.11.2	------------------------------NOTE------------------------------ Not required to be performed prior to entry into MODE 3. --	
	Perform a complete cycle of each PORV.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12

An LTOP System shall be OPERABLE with a maximum of zero safety injection pumps and two charging pumps capable of injecting into the RCS and the accumulators isolated and one of the following pressure relief capabilities:

a. Two power operated relief valves (PORVs) with lift settings within the limits specified in the PTLR, or

b. Two residual heat removal (RHR) suction relief valves with setpoints ≥ 436.5 psig and ≤ 463.5 psig, or

c. One PORV with a lift setting within the limits specified in the PTLR and one RHR suction relief valve with a setpoint ≥ 436.5 psig and ≤ 463.5 psig, or

d. The RCS depressurized and an RCS vent of ≥ 2.98 square inches.

--NOTE--
Accumulator may be unisolated when accumulator pressure is less than the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

APPLICABILITY:

MODE 4, MODE 5,
MODE 6 when the reactor vessel head is on

--NOTE--
The LCO is not applicable when all RCS cold leg temperatures are > 320°F and the following conditions are met:

a. At least one reactor coolant pump is in operation, and

b. Pressurizer level is ≤ 92%, and

c. The plant heatup rate is limited to 60°F in any one hour period.

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable when entering MODE 4.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more safety injection pumps capable of injecting into the RCS.	A.1	Initiate action to verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	Immediately
B. Three charging pumps capable of injecting into the RCS.	B.1	Initiate action to verify a maximum of two charging pumps are capable of injecting into the RCS.	Immediately
C. An accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	C.1	Isolate affected accumulator.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Increase RCS cold leg temperature to > 320°F. AND Verify at least one reactor coolant pump is in operation. AND Pressurizer level is ≤ 92%. AND The plant heatup rate is limited to 60°F in any one hour period.	12 hours
	OR	
	D.2 Increase RCS average temperature to > 350°F.	12 hours
	OR	
	D.3 Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	12 hours
E. One required RCS relief valve inoperable in MODE 4.	E.1 Restore required RCS relief valve to OPERABLE status.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One required RCS relief valve inoperable in MODE 5 or 6.	F.1 Restore required RCS relief valve to OPERABLE status.	24 hours
G. Two required RCS relief valves inoperable. OR Required Action and associated Completion Time of Condition A, B, D, E, or F not met. OR LTOP System inoperable for any reason other than Condition A, B, C, D, E, or F.	G.1 Depressurize RCS and establish RCS vent of ≥ 2.98 square inches.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.12.2	Verify a maximum of two charging pumps are capable of injecting into the RCS.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.3	Verify each accumulator is isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.12.5	Verify required RCS vent ≥ 2.98 square inches open.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.12.7	Not Used.	
SR 3.4.12.8	--------------------------------NOTE-------------------------------- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ 350°F. -- Perform a COT on each required PORV, excluding actuation.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 RCS Operational LEAKAGE

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 1 gpm unidentified LEAKAGE;

c. 10 gpm identified LEAKAGE; and

d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Pressure boundary LEAKAGE exists. <u>OR</u> Primary to secondary LEAKAGE not within limits	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	-------------------------------NOTES------------------------------- 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. -- Verify RCS operational LEAKAGE is within limits by performance of RCS water inventory balance.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.13.2	-------------------------------NOTE------------------------------- Not required to be performed until 12 hours after establishment of steady state operation. -- Verify primary to secondary LEAKAGE is ≤150 gallons per day through any one SG.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 RCS Pressure Isolation Valve (PIV) Leakage

LCO 3.4.14 Leakage from each RCS PIV shall be within limit.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4, except valves in the residual heat removal (RHR) flow path when in, or during the transition to or from, the RHR mode of operation

ACTIONS

-----NOTES-----

1. Separate Condition entry is allowed for each flow path.
2. Enter applicable Conditions and Required Actions for systems made inoperable by an inoperable PIV.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with leakage from one or more RCS PIVs not within limit.	---------------------NOTE--------------------- Each valve used to satisfy Required Action A.1 and Required Action A.2 must have been verified to meet SR 3.4.14.1 and be in the reactor coolant pressure boundary or the high pressure portion of the system. ---	
	A.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of one closed manual, deactivated automatic, or check valve.	4 hours
	AND	
	A.2.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of a second closed manual, deactivated automatic, or check valve.	72 hours
	OR	
	A.2.2 Restore RCS PIV to within limits.	72 hours
B. Required Action and associated Completion Time for Condition A not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours
C. RHR System interlock function inoperable.	C.1 Isolate the affected penetration by use of one closed manual or deactivated automatic valve.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	-----NOTES----- 1. Not required to be performed in MODES 3 and 4. 2. Not required to be performed on the RCS PIVs located in the RHR flow path when in the shutdown cooling mode of operation. 3. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. ---------- Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2215 psig and ≤ 2255 psig.	In accordance with the Inservice Testing Program, and in accordance with the Surveillance Frequency Control Program. <u>AND</u> Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, and if leakage testing has not been performed in the previous 9 months except for valves 8701A, 8701B, 8702A and 8702B <u>AND</u> Within 24 hours following check valve actuation due to flow through the valve

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.2	Verify RHR System interlock prevents the valves from being opened with a simulated or actual RCS pressure signal $\geq$ 442 psig, except when the valves are open to satisfy LCO 3.4.12.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One Containment Sump Level and Flow Monitoring System;

b. One containment atmosphere particulate radioactivity monitor; and

c. One containment air cooler condensate flow rate monitor or one containment atmosphere radioactivity monitor (gaseous).

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required Containment Sump Level and Flow Monitoring System inoperable.	A.1 ------------------NOTE------------------ Not required until 12 hours after establishment of steady state operation. --- Perform SR 3.4.13.1.	 Once per 24 hours
	AND	
	A.2 Restore Containment Sump Level and Flow Monitoring System to OPERABLE status.	30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere particulate radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere.	Once per 24 hours
	<u>OR</u>	
	B.1.2 ------------------NOTE------------------ Not required until 12 hours after establishment of steady state operation. --- Perform SR 3.4.13.1.	Once per 24 hours
	<u>AND</u>	
	B.2 Restore required containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C Required containment atmosphere gaseous radioactivity monitor inoperable. AND Required containment air cooler condensate flow rate monitor inoperable.	C.1.1 Analyze grab samples of the containment atmosphere.	Once per 24 hours
	OR	
	C.1.2 -----------------NOTE----------------- Not required until 12 hours after establishment of steady state operation. -- Perform SR 3.4.13.1.	Once per 24 hours
	AND	
	C.2.1 Restore required containment atmosphere gaseous radioactivity monitor to OPERABLE status.	30 days
	OR	
	C.2.2 Restore required containment air cooler condensate flow rate monitor to OPERABLE status.	30 days
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 5.	36 hours
E. All required monitors inoperable.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate and gaseous radioactivity monitors.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate and gaseous radioactivity monitors.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required Containment Sump Level and Flow Monitoring System.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate and gaseous radioactivity monitors.	In accordance with the Surveillance Frequency Control Program.
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment air cooler condensate flow rate monitor.	In accordance with the Surveillance Frequency Control Program.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 not within limit.	---NOTE--- LCO 3.0.4.c is applicable. ------	
	A.1 Verify DOSE EQUIVALENT I-131 $\leq 60\ \mu Ci/gm$.	Once per 4 hours
	<u>AND</u>	
	A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. DOSE EQUIVALENT XE-133 not within limit.	B.1 ---NOTE--- LCO 3.0.4.c is applicable. ------	
	Restore DOSE EQUIVALENT XE-133 to within limit.	48 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. <u>OR</u> DOSE EQUIVALENT I-131 > 60 μCi/gm.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	-----NOTE----- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 500 μCi/gm.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.16.2	------------NOTE------------ Only required to be performed in MODE 1. ---------------------------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 0.45 μCi/gm.	In accordance with the Surveillance Frequency Control Program. AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.16.3	DELETED	DELETED

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 Steam Generator (SG) Tube Integrity

LCO 3.4.17 SG tube integrity shall be maintained.

AND

All SG tubes satisfying the tube repair criteria shall be plugged or repaired in accordance with the Steam Generator Program.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

---NOTES---
Separate Condition entry is allowed for each SG tube.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SG tubes satisfying the tube repair criteria and not plugged or repaired in accordance with the Steam Generator Program.	A.1 Verify tube integrity of the affected tube(s) is maintained until the next refueling outage or SG tube inspection.	7 days
	AND	
	A.2 Plug or repair the affected tube(s) in accordance with the Steam Generator Program.	Prior to entering MODE 4 following the next refueling outage or SG tube inspection

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR SG tube integrity not maintained.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.17.1	Verify SG tube integrity in accordance with the Steam Generator Program.	In accordance with the Steam Generator Program
SR 3.4.17.2	Verify that each inspected SG tube that satisfies the tube repair criteria is plugged or repaired in accordance with the Steam Generator Program.	Prior to entering MODE 4 following a SG tube inspection

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.1.2	Verify borated water volume in each accumulator is $\geq$ 6119 gallons and $\leq$ 6597 gallons.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is $\geq$ 623 psig and $\leq$ 644 psig.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.1.4	Verify boron concentration in each accumulator is $\geq$ 2300 ppm and $\leq$ 2600 ppm.	In accordance with the Surveillance Frequency Control Program. AND ----------NOTE--------- Only required to be performed for affected accumulators --------------------------- Once within 6 hours after each solution volume increase of $\geq$ 101 gallons that is not the result of addition from the refueling water storage tank

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is > 1000 psig.	In accordance with the Surveillance Frequency Control Program.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS -- Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

---NOTES---

1. In MODE 3, both safety injection (SI) pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve testing per SR 3.4.14.1.

2. Operation in MODE 3 with ECCS pumps made incapable of injecting, pursuant to LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," is allowed for up to 4 hours or until the temperature of all RCS cold legs exceeds 375°F, whichever comes first.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One train inoperable because of the inoperability of a centrifugal charging pump.	A.1 Restore pump to OPERABLE status.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more trains inoperable for reasons other than one inoperable centrifugal charging pump. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1 Restore train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed. Number / Position / Function 8802 A&B / Closed / SI Pump to Hot Legs 8809 A&B / Open / RHR to Cold Legs 8835 / Open / SI Pump to Cold Legs 8840 / Closed / RHR to Hot Legs 8806 / Open / SI Pump Suction from RWST 8813 / Open / SI Pump Miniflow Valve	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.2	Verify each ECCS 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 3.5.2.3	Verify ECCS piping is full of water.	Prior to entry into MODE 3
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each mechanical position stop is in the correct position. <u>Valve Number</u> 8810A 8816A 8822A 8810B 8816B 8822B 8810C 8816C 8822C 8810D 8816D 8822D	In accordance with the Surveillance Frequency Control Program.
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet strainers show no evidence of structural distress or abnormal corrosion.	In accordance with the Surveillance Frequency Control Program.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS -- Shutdown

LCO 3.5.3 One ECCS train shall be OPERABLE.

---NOTE---
An RHR train may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned to the ECCS mode of operation.

APPLICABILITY: MODE 4

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable to ECCS Centrifugal Pump subsystem.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS residual heat removal (RHR) subsystem inoperable.	A.1 Initiate action to restore required ECCS RHR subsystem to OPERABLE status.	Immediately
B. Required ECCS Centrifugal Charging Pump subsystem inoperable.	B.1 Restore required ECCS Centrifugal Charging Pump subsystem to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	The following SRs are applicable for all equipment required to be OPERABLE: SR 3.5.2.1 SR 3.5.2.4 SR 3.5.2.7 SR 3.5.2.8	In accordance with applicable SRs

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWST boron concentration not within limits. OR RWST borated water temperature not within limits.	A.1 Restore RWST to OPERABLE status.	8 hours
B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	---NOTE--- Only required to be performed when ambient air temperature is < 40°F or > 120°F. --- Verify RWST borated water temperature is ≥ 40°F and ≤ 120°F.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.4.2	Verify RWST borated water volume is ≥ 473,731 gallons.	In accordance with the Surveillance Frequency Control Program.
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2400 ppm and ≤ 2600 ppm.	In accordance with the Surveillance Frequency Control Program.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow shall be ≤ 40 gpm with RCS pressure ≥ 2215 psig and ≤ 2255 psig and the charging flow control valve full open.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow within limit with RCS pressure ≥ 2215 psig and ≤ 2255 psig and the charging flow control valve full open.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	-----NOTE----- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig. ---------- Verify manual seal injection throttle valves are adjusted to give a flow within limit with RCS pressure ≥ 2215 psig and ≤ 2255 psig and the charging flow control valve full open.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	------------------------------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. --- Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1	Verify each 48 inch Containment Purge and 12 inch Hydrogen Purge valve is sealed closed, except for one purge valve in a penetration flow path while in Condition D of this LCO.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.3.2	Not used.	
SR 3.6.3.3	-----NOTES----- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. ---------- Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.3.4	-----NOTES----- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. The blind flange on the fuel transfer canal need not be verified closed except after each drainage of the canal. ---------- Verify each containment isolation manual valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.3.5	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.6	Not used.	
SR 3.6.3.7	------------------------------NOTE------------------------------ This surveillance is not required when the penetration flow path is isolated by a leak tested blank flange. -- Perform leakage rate testing for containment purge, hydrogen purge and containment pressure relief valves with resilient seals.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.3.8	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.3.9	Not used.	
SR 3.6.3.10	Not used.	
SR 3.6.3.11	Not used.	
SR 3.6.3.12	Not used.	
SR 3.6.3.13	Not used.	

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ - 0.3 psig and ≤ + 1.3 psig.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1	Verify containment pressure is within limits.	In accordance with the Surveillance Frequency Control Program.

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be ≤ 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limit.	A.1 Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program.

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours
C. Two containment spray trains inoperable.	C.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray 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.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.2	Not used.	
SR 3.6.6.3	Not used.	
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.6.6.7	Not used.	
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	Following maintenance which could result in nozzle blockage

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.2.1	-----NOTE----- Only required to be performed in MODES 1 and 2. ---------- Verify the isolation time of each MSIV is ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.7.2.2	-----NOTE----- Only required to be performed in MODES 1 and 2. ---------- Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more FIV or FCV bypass valves inoperable.	C.1 Close or isolate bypass valve. <u>AND</u> C.2 Verify bypass valve is closed or isolated.	72 hours Once per 7 days
D. Two valves in the same flowpath inoperable	D.1 Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. <u>AND</u> E.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the isolation time of each FIV, FCV, and associated bypass valves is ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.7.3.2	Verify each FIV, FCV, and associated bypass valves 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 3.7.5.1	------------------------------NOTE------------------------------ AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. --- Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.5.2	------------------------------NOTE------------------------------ Not required to be performed for the turbine driven AFW pump until 24 hours after $\geq$ 532 psig in the steam generator. --- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice testing Program
SR 3.7.5.3	------------------------------NOTE------------------------------ AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. --- Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.4	-----NOTES----- 1. Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 532 psig in the steam generator. 2. AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW operation. ----- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

LCO 3.7.6 The CST level shall be ≥ 53%.

APPLICABILITY: MODES 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST level not within limit.	A.1 Verify by administrative means OPERABILITY of backup water supply. AND A.2 Restore CST level to within limit.	4 hours AND Once per 12 hours thereafter 7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST level is ≥ 53%.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ------------------------------ A.1 Restore CCW train to OPERABLE status.	 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.7.1	-------------------------------NOTE------------------------------- Isolation of CCW flow to individual components does not render the CCW System inoperable. --- Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.8 Station Service Water System (SSWS)

LCO 3.7.8 Two SSWS trains and a SSW Pump on the opposite unit with its associated cross-connects shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required SSW Pump on the opposite unit or its associated cross-connects inoperable.	A.1 Restore a SSW Pump on the opposite unit to OPERABLE status.	7 days
	AND	
	A.2 Restore associated cross-connects to OPERABLE status.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One SSWS train inoperable.	B.1 -------------------NOTES------------------ 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources -- Operating," for emergency diesel generator made inoperable by SSWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops -- MODE 4," for residual heat removal loops made inoperable by SSWS. --- Restore SSWS train to OPERABLE status.	 72 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	-----------------------------NOTE----------------------------- Isolation of SSWS flow to individual components does not render the SSWS inoperable. -- Verify each SSWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.8.2	Verify one complete cycle of each required cross-connect valve that is not locked open.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.8.3	Verify each SSW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The Safe Shutdown Impoundment (SSI) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SSI level less than required.	A.1 Restore SSI level to within limits.	7 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> SSI inoperable for reasons other than Condition A.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of SSI is ≥ 770 ft mean sea level.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.9.2	Verify station service water intake temperature is ≤ 102°F.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.10 Control Room Emergency Filtration/Pressurization System (CREFS)

LCO 3.7.10 Two CREFS trains shall be OPERABLE

---NOTE---
The Control Room envelope (CRE) boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREFS train inoperable for reasons other than Condition B.	A.1 Restore CREFS train to OPERABLE status.	7 days
B. One or more CREFS Trains inoperable due to inoperable CRE boundary in MODES 1, 2, 3, and 4.	B.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u>	
	B.2 Verify mitigating actions to ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	<u>AND</u>	
	B.3 Restore CRE boundary to OPERABLE status.	90 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1 Place OPERABLE CREFS train in emergency recirculation mode. <u>OR</u> D.2.1 Suspend CORE ALTERATIONS. <u>AND</u> D.2.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately Immediately
E. Two CREFS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies. <u>OR</u> One or more CREFS trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of irradiated fuel assemblies.	E.1 Suspend CORE ALTERATIONS. <u>AND</u> E.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately
F. Two CREFS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.10.1	Operate each CREFS trains Emergency Pressurization Unit for ≥ 10 continuous hours with the heaters operating and Emergency Filtration Unit ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.10.2	Perform required CREFS testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Verify each CREFS train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.10.4	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

3.7 PLANT SYSTEMS

3.7.11 Control Room Air Conditioning System (CRACS)

LCO 3.7.11 Two CRACS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CRACS train inoperable.	A.1 Restore CRACS train to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours
C. Required Action and associated Completion Time of Condition A not met in MODE 5, or 6, or during movement of irradiated fuel assemblies.	C.1 Place OPERABLE CRACS train in operation.	Immediately
	OR	
	C.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	C.2.2 Suspend movement of irradiated fuel assemblies.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two CRACS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1.1 Verify at least 100% of the required heat removal capability equivalent to a single OPERABLE train available.	Immediately
	<u>AND</u>	
	D.1.2 Restore the CRACS trains to OPERABLE status.	30 days
	<u>OR</u>	
	D.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	D.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CRACS trains inoperable in MODE 1, 2, 3, or 4.	E.1.1 Verify at least 100% of the required heat removal capability equivalent to a single OPERABLE train available.	Immediately
	<u>AND</u>	
	E.1.2 Restore one CRACS train to OPERABLE status.	30 days
	<u>OR</u>	
	E.2 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CRACS train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.12 Primary Plant Ventilation System (PPVS) - ESF Filtration Trains

LCO 3.7.12 Two PPVS trains shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. With one or more PPVS trains unable to maintain a negative pressure envelope in the Auxiliary, Safeguards, and Fuel Buildings ≥ 0.05 inch water gauge.	A.1 Restore PPVS trains to OPERABLE status.	30 days
B. With one or more PPVS trains unable to maintain a negative pressure envelope in the Auxiliary, Safeguards, and Fuel Buildings ≥ 0.01 inch water gauge.	B.1 Restore ability of PPVS trains to maintain a negative pressure envelope of ≥ 0.01 inch water gauge pressure.	7 days
C. One PPVS train inoperable for any reason except Conditions A or B.	C.1 Restore PPVS train to OPERABLE status.	7 days
D. Required Actions and associated Completion Times not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each ESF Filtration train for ≥ 10 continuous hours with the heaters operating.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.12.2	Perform required ESF Filtration Unit filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.3	Verify each PPVS train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.12.4	Verify one PPVS train can maintain a pressure ≤ -0.05 inches water gauge relative to atmospheric pressure during the post accident mode of operation.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.12.5	Not used.	
SR 3.7.12.6	Verify each PPVS non-ESF fan stops on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.13 Fuel Building Air Cleanup System (FBACS)

NOT USED

3.7 PLANT SYSTEMS

3.7.14 Penetration Room Exhaust Air Cleanup System (PREACS)

NOT USED

3.7 PLANT SYSTEMS

3.7.15 Fuel Storage Area Water Level

LCO 3.7.15 The fuel storage area water level shall be ≥ 23 ft over the top of the storage racks

APPLICABILITY: During movement of irradiated fuel assemblies in a spent fuel storage area.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage area water level not within limit.	A.1 -----------------NOTE------------------ LCO 3.0.3 is not applicable. --- Suspend movement of irradiated fuel assemblies in the fuel storage area.	 Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.15.1	Verify the fuel storage area water level is ≥ 23 ft above the top of the storage racks.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Boron Concentration

LCO 3.7.16 The fuel storage pool boron concentration shall be ≥ 2000 ppm.

APPLICABILITY: When fuel assemblies are stored in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool boron concentration not within limit.	----------NOTE---------- LCO 3.0.3 is not applicable. ------------------------	
	A.1 Suspend movement of fuel assemblies in the fuel storage pool	Immediately
	AND	
	A.2 Initiate action to restore fuel storage pool boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.17 Spent Fuel Assembly Storage

LCO 3.7.17 The combination of initial enrichment, burnup and decay time of each spent fuel assembly stored in Region II racks shall be within either (1) the "acceptable" domain of Figure 3.7.17-1 in a 4 out of 4 configuration, (2) the "acceptable" domain of Figure 3.7.17-2 in a 3 out of 4 configuration, (3) the "acceptable" domain of Figure 3.7.17-3 in a 2 out of 4 configuration, or (4) shall be stored in a 1 out of 4 configuration. The acceptable storage configurations are shown in Figure 3.7.17-4.

APPLICABILITY: Whenever any fuel assembly is stored in Region II racks of the spent fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 ------------------NOTE------------------ LCO 3.0.3 is not applicable. --- Initiate action to move the noncomplying fuel assembly to an acceptable storage location.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.17.1	Verify by administrative means the initial enrichment, burnup and decay time of the fuel assembly is in accordance with either (1) the "acceptable" domain of Figure 3.7.17-1 in a 4 out of 4 configuration, (2) the "acceptable" domain of Figure 3.7.17-2 in a 3 out of 4 configuration, (3) the "acceptable" domain of Figure 3.7.17-3 in a 2 out of 4 configuration, or (4) a 1 out of 4 configuration. The acceptable storage configurations are shown in Figure 3.7.17-4.	Prior to storing the fuel assembly in Region II racks

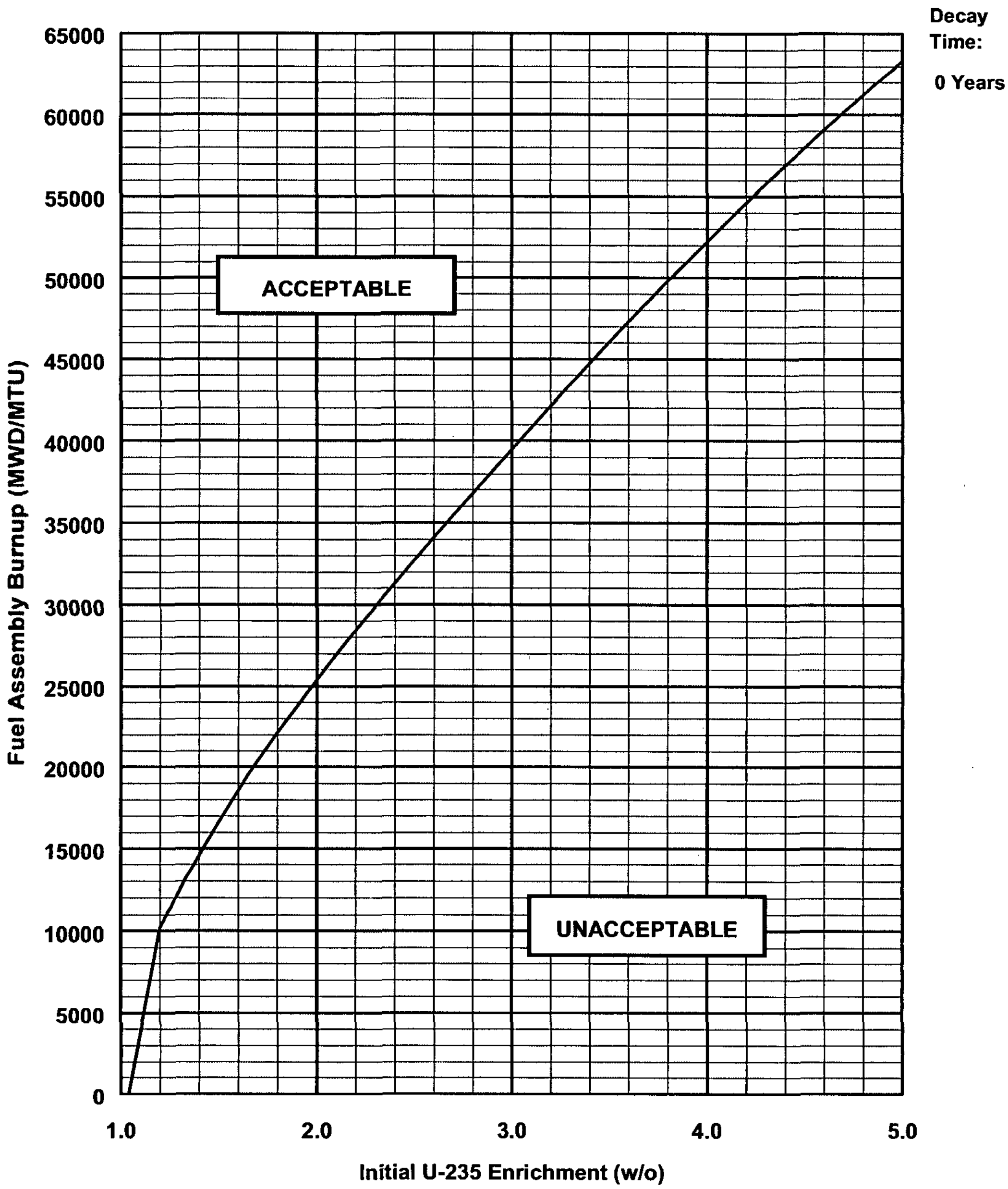

Figure 3.7.17-1 (page 1 of 1)
Fuel Assembly Burnup vs. U-235 Enrichments vs. Decay Time Limits
For a 4 out of 4 Storage Configuration in Region II Racks

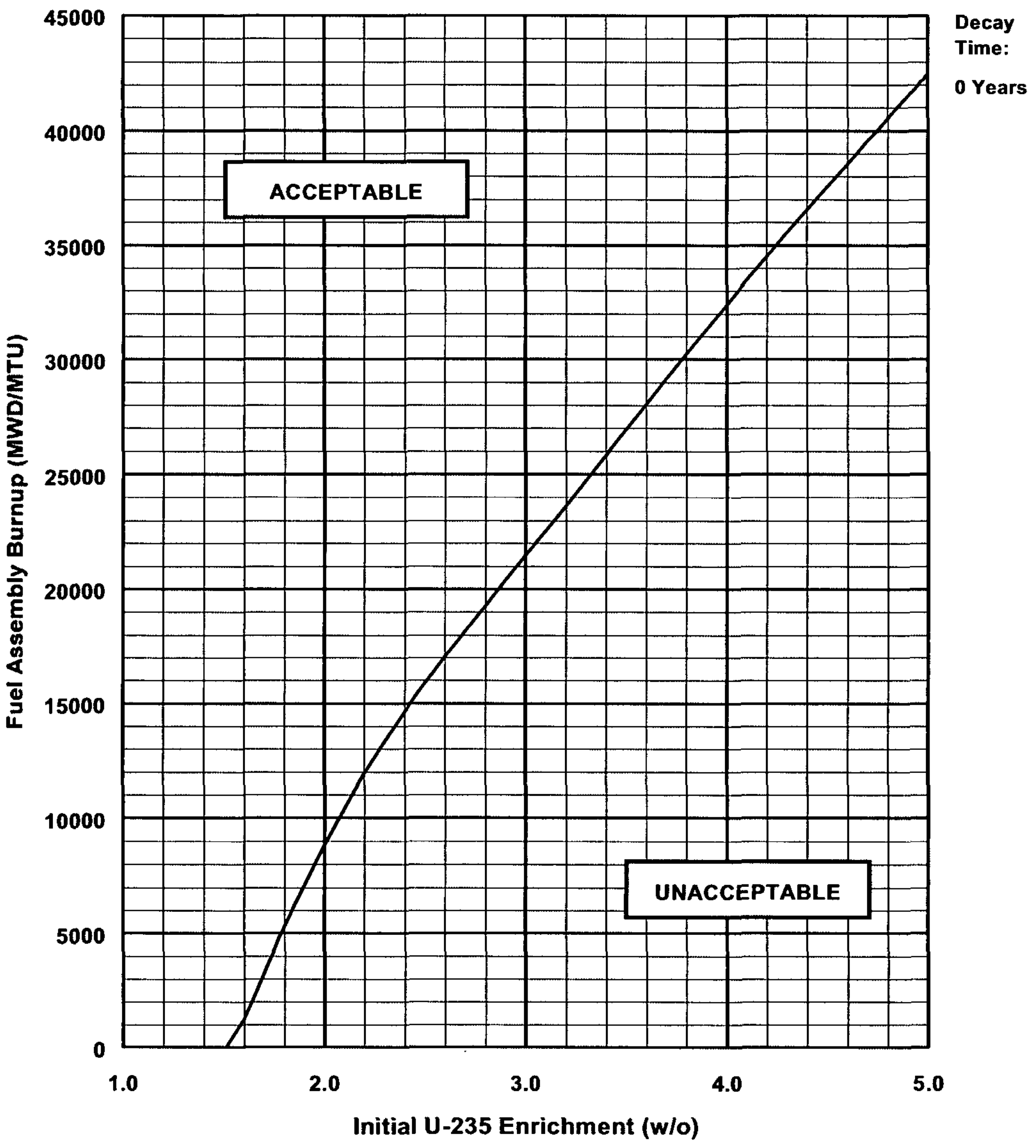

Figure 3.7.17-2 (page 1 of 1)
Minimum Burnup vs. Initial U-235 Enrichment vs. Decay Time
For a 3 out of 4 Storage Configuration in Region II Racks

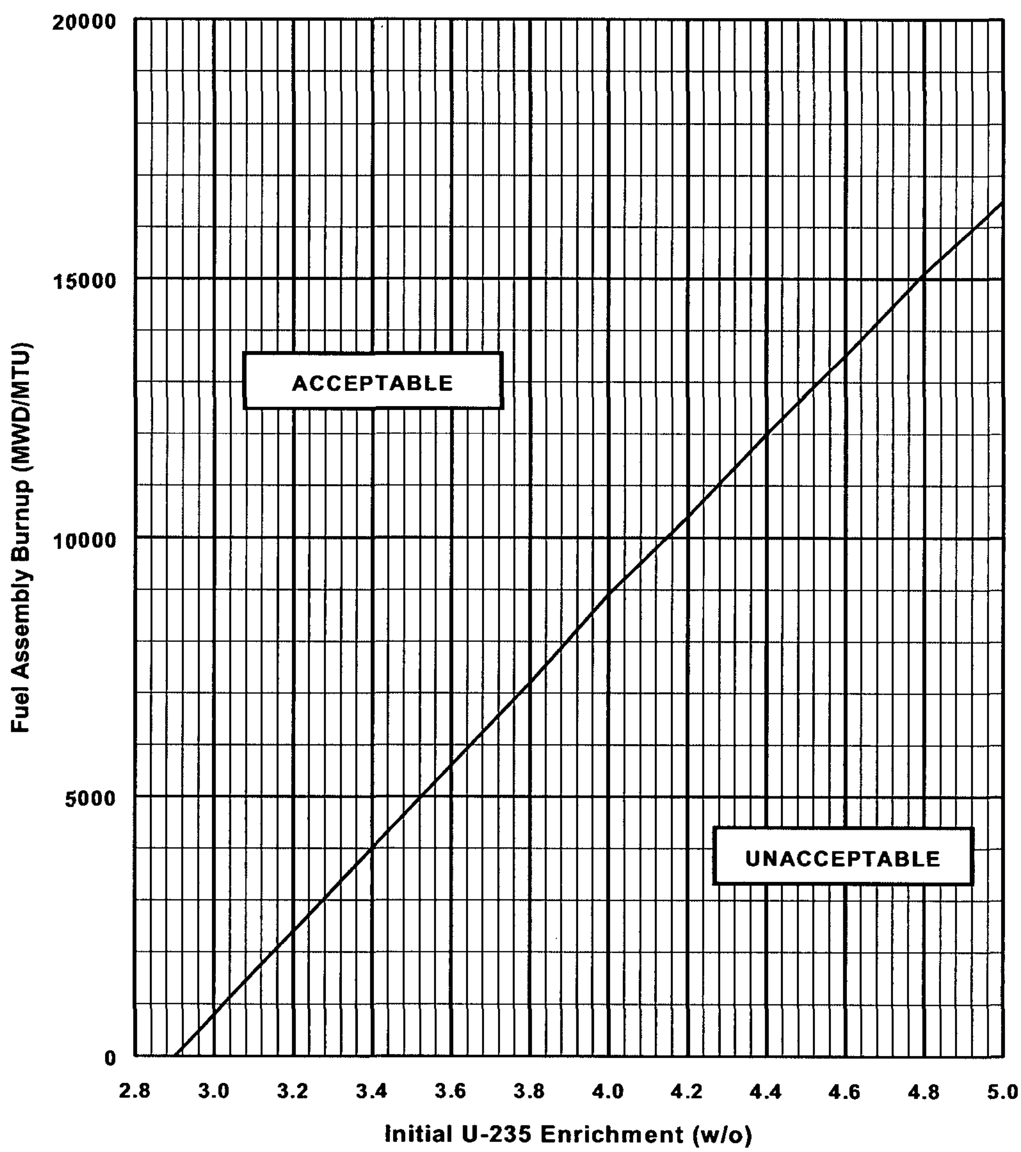

Figure 3.7.17-3 (page 1 of 1)
Minimum Burnup vs. Initial U-235 Enrichment
For a 2 out of 4 Storage Configuration in Region II Racks

A	A	A	A	A	A
A	A	A	A	A	A
A	A	A	A	A	A
A	A	A	A	A	A
A	A	A	A	A	A
A	A	A	A	A	A

	B		B		B
B	B	B	B	B	B
	B		B		B
B	B	B	B	B	B
	B		B		B
B	B	B	B	B	B

C		C		C	
	C		C		C
C		C		C	
	C		C		C
C		C		C	
	C		C		C

	D		D		D
	D		D		D
	D		D		D

A Region II (4/4), new or partially spent fuel assemblies in the "acceptable" domain of Figure 3.7.17-1.

B Region II (3/4), new or partially spent fuel assemblies in the "acceptable" domain of Figure 3.7.17-2.

C Region II (2/4), new or partially spent fuel assemblies in the "acceptable" domain of Figure 3.7.17-3.

D Region II (1/4), new or partially spent fuel assemblies which are stored in an expanded checkerboard (1 out of 4).

- empty

Note: All possible 2 by 2 matrices containing Region II rack cells shall comply with at least one of the following: (1) within the "acceptable" domain of Figure 3.7.17-1 in a 4 out of 4 configuration, (2) within the "acceptable" domain of Figure 3.7.17-2 in a 3 out of 4 configuration, (3) within the "acceptable" domain of Figure 3.7.17-3 in a 2 out of 4 configuration, or (4) a 1 out of 4 configuration.

Region I and Region II interface restrictions: The Region II 1 out of 4 configuration shall be oriented such that the single fuel assembly resides in the internal row with the empty cells facing Region I. There are no interface restrictions between the Region II (2/4, 3/4, 4/4) and Region I configurations.

Figure 3.7.17-4 (page 1 of 1)
Storage Configurations (4/4, 3/4, 2/4, 1/4) in Region II Racks

3.7 PLANT SYSTEMS

3.7.18 Secondary Specific Activity

LCO 3.7.18 The specific activity of the secondary coolant shall be ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. <u>AND</u> A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1	Verify the specific activity of the secondary coolant is ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.19 Safety Chilled Water

LCO 3.7.19 Two safety chilled water trains shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One safety chilled water train inoperable.	A.1 Restore safety chilled water train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.19.1	-----NOTE----- Isolation of safety chilled water flow to individual components does not render the safety chilled water system inoperable. -----	
	Verify each safety chilled water manual, power operated, and automatic valve servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.19.2	Verify each safety chilled water pump and chiller starts on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

3.7 PLANT SYSTEMS

3.7.20 UPS HVAC System

LCO 3.7.20 Two UPS HVAC System Trains shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One UPS HVAC System train inoperable.	A.1 Verify the affected UPS & Distribution Room is supported by an OPERABLE UPS A/C Train.	Immediately
	AND	
	A.2 Restore the inoperable UPS HVAC train to OPERABLE status.	30 days
B. Two UPS HVAC System trains inoperable. OR Required Action A.1 and associated Completion Time not met.	B.1 Verify air circulation is maintained by at least one UPS A/C Train.	Immediately
	AND	
	B.2 Verify the air temperature in the affected UPS & Distribution Room(s) does not exceed the maximum temperature limit for the room(s).	12 hours AND Once per 12 hours thereafter
	AND	
	B.3 Restore UPS HVAC System train to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action B.1 and associated Completion Time not met.	C.1 Restore the required support.	1 hour
D. Required Action and associated Completion Time of Required Action A.2, B.2, B.3 or C.1 not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.20.1	Verify each required UPS & Distribution Room Fan Coil Unit operates ≥ 1 continuous hour.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.20.2	Verify each required UPS A/C train operates for ≥ 1 continuous hour.	In accordance with the Surveillance Frequency Control Program.
SR 3.7.20.3	Verify each required UPS A/C train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Three or more required AC sources inoperable.	H.1 Enter LCO 3.0.3.	Immediately
I. One Blackout Sequencer inoperable	I.1 Declare associated DG inoperable	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.2	---NOTES--- 1. Performance of SR 3.8.1.7 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 3.8.1.7 must be met. --- Verify each DG starts from standby conditions and achieves steady state voltage $\geq$ 6480 V and $\leq$ 7150 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	-----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 3.8.1.2 or SR 3.8.1.7. ---------- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 6300 kW and ≤ 7000 kW.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.4	Verify each day tank contains ≥ 1440 gal of fuel oil.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	---NOTE--- All DG starts may be preceded by an engine prelube period. --- Verify each DG starts from standby condition and achieves: a. in $\leq$ 10 seconds, voltage $\geq$ 6480 V and frequency $\geq$ 58.8 Hz; and b. steady state, voltage $\geq$ 6480 V and $\leq$ 7150 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.8	---NOTE--- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. --- Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate required offsite circuit.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----- 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 $\leq$ 66.75 Hz; and b. Within 3 seconds following load rejection, the voltage is $\geq$ 6480 V and $\leq$ 7150 V.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.10	Verify each DG does not trip and voltage is maintained $\leq$ 8280 V during and following a load rejection of $\geq$ 6300 kW and $\leq$ 7000 kW.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	---NOTES--- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. --- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤10 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 6480 V and ≤ 7150 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.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	------------------------------NOTE------------------------------ All DG starts may be preceded by prelube period. -- Verify on an actual or simulated Safety Injection (SI) actuation signal each DG auto-starts from standby condition and; a. in ≤ 10 seconds after auto-start and during tests, achieves voltage ≥ 6480 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 6480 V and ≤ 7150 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.13	------------------------------NOTE------------------------------ For Unit 2, testing need only be performed for LOOP concurrent with SI until startup following 2RFO5. -- Verify each DG's automatic trips are bypassed on actual or simulated (i) loss of voltage signal on the emergency bus, and (ii) SI actuation signal, except: a. Engine overspeed; and b. Generator differential current.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.14	-------------------------------NOTE------------------------------ Momentary transients outside the load and power factor ranges do not invalidate this test. --- Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 6900 kW and ≤ 7700 kW; and b. For the remaining hours of the test loaded ≥ 6300 kW and ≤ 7000 kW.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.15	------------------------------NOTES------------------------------ 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 6300 kW and ≤ 7000 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. --- Verify each DG starts and achieves: a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz; and b. steady state, voltage ≥ 6480 V and ≤ 7150 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.16	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- 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.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.17	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated SI actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.18	-----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ----- Verify interval between each sequenced load block is within ± 10% of design interval for each automatic load sequencer.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	-----NOTES----- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated SI actuation 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 $\leq$ 10 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage $\geq$ 6480 V and $\leq$ 7150 V, 4. achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for $\geq$ 5 minutes.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	-----NOTE----- All DG starts may be preceded by an engine prelube period. ----- Verify when started simultaneously from standby condition, each DG achieves: a. in ≤ 10 seconds, voltage ≥ 6480 V and frequency ≥ 58.8 Hz, and b. steady state, voltage ≥ 6480 V, and ≤ 7150 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.21	Calibrate BO sequencers.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.1.22	-----NOTES----- 1. Verification of setpoint is not required. 2. Actuation of final devices is not included. ----- Perform TADOT for SI and BO sequencers.	In accordance with the Surveillance Frequency Control Program.

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	-----NOTE----- Not required to be performed until the engine has been shutdown for > 10 hours. ----- Verify lubricating 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 pressure is ≥ 180 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.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and Associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.4.2	Verify each battery charger supplies ≥ 300 amps at greater than or equal to the minimum established charger test voltage for ≥ 8 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.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.3	-------------------------------NOTES------------------------------ 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. Verify requirement during MODES 3, 4, 5, 6 or with core off-loaded. --- 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.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met. <u>OR</u> One or two batteries on one train with one or more battery cells float voltage < 2.07 V and float current > 2 amps.	F.1 Declare associated battery(ies) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.6.1	-----NOTE----- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1 ---------- Verify each battery float current is ≤ 2 amps.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program.
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.6	-------------------------------NOTE------------------------------- Verify requirement during MODES 3, 4, 5, 6 or with core off-loaded. --	
	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 18 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 the expected life with capacity ≥ 100% of manufacturer's rating

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, and alignment to required AC vital buses.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage and alignments to required AC vital buses.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	
	A.2.5 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program.

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of all filled portions of the Reactor Coolant System, the refueling canal, and the refueling cavity, that have direct access to the reactor vessel, shall be maintained within the limit specified in the COLR.

---NOTE---
While this LCO is not met, entry into MODE 6 from MODE 5 is not permitted.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2 Suspend positive reactivity additions.	Immediately
	<u>AND</u>	
	A.3 Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify each valve that isolates unborated water sources is secured in the closed position.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.9.3.2	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	In accordance with the Surveillance Frequency Control Program.
SR 3.9.4.2	-------------------------------NOTE------------------------------- Only required for an open equipment hatch --- Verify the capability to install the equipment hatch.	In accordance with the Surveillance Frequency Control Program.
SR 3.9.4.3	Verify each required containment ventilation isolation valve 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 3.9.5.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of $\geq$ 3800 gpm.	In accordance with the Surveillance Frequency Control Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No RHR loop in operation.	B.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.	Immediately
	AND	
	B.2 Initiate action to restore one RHR loop to operation.	Immediately
	AND	
	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of $\geq$ 1000 gpm.	In accordance with the Surveillance Frequency Control Program.
SR 3.9.6.2	Verify correct breaker alignment and indicated power available to the required RHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program.

3.9 REFUELING OPERATIONS

3.9.7 Refueling Cavity Water Level

LCO 3.9.7 Refueling cavity water level shall be maintained ≥ 23 ft above the top of reactor vessel flange.

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refueling cavity water level not within limit.	A.1 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify refueling cavity water level is ≥ 23 ft above the top of reactor vessel flange.	In accordance with the Surveillance Frequency Control Program.

5.5 Programs and Manuals

5.5.21 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 3.02 and 3.03 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

ATTACHMENT 6 to TXX-11093

RETYPED TECHNICAL SPECIFICATION BASES PAGES

(For Information Only)

Pages	B 3.1-4	B 3.3-100	B 3.4-60	B 3.7-18	B 3.8-22
	B 3.1-10	B 3.3-101	B 3.4-61	B 3.7-29	B 3.8-23
	B 3.1-24	B 3.3-102	B 3.4-62	B 3.7-30	B 3.8-24
	B 3.1-29	B 3.3-103	B 3.4-67	B 3.7-31	B 3.8-25
	B 3.1-34	B 3.3-120	B 3.4-68	B 3.7-34	B 3.8-26
	B 3.1-35	B 3.3-121	B 3.4-72	B 3.7-38	B 3.8-27
	B 3.1-45	B 3.3-126	B 3.4-73	B 3.7-42	B 3.8-40
	B 3.1-46	B 3.3-127	B 3.4-80	B 3.7-43	B 3.8-42
	B 3.2-9	B 3.3-134	B 3.4-85	B 3.7-46	B 3.8-43
	B 3.2-11	B 3.3-135	B 3.5-6	B 3.7-53	B 3.8-50
	B 3.2-19	B 3.3-141	B 3.5-7	B 3.7-54	B 3.8-51
	B 3.2-22	B 3.3-142	B 3.5-16	B 3.7-59	B 3.8-62
	B 3.2-28	B 3.3-143	B 3.5-17	B 3.7-64	B 3.8-63
	B 3.2-29	B 3.3-148	B 3.5-18	B 3.7-65	B 3.8-64
	B 3.3-43	B 3.3-149	B 3.5-26	B 3.7-70	B 3.8-68
	B 3.3-45	B 3.4-5	B 3.5-27	B 3.7-76	B 3.8-74
	B 3.3-46	B 3.4-9	B 3.5-30	B 3.7-82	B 3.8-80
	B 3.3-47	B 3.4-15	B 3.6-10	B 3.7-85	B 3.8-86
	B 3.3-48	B 3.4-18	B 3.6-21	B 3.7-90	B 3.9-4
	B 3.3-49	B 3.4-23	B 3.6-23	B 3.8-14	B 3.9-7
	B 3.3-50	B 3.4-27	B 3.6-24	B 3.8-15	B 3.9-10
	B 3.3-51	B 3.4-31	B 3.6-28	B 3.8-16	B 3.9-16
	B 3.3-52	B 3.4-32	B 3.6-31	B 3.8-17	B 3.9-20
	B 3.3-53	B 3.4-35	B 3.6-36	B 3.8-19	B 3.9-23
	B 3.3-98	B 3.4-39	B 3.6-37	B 3.8-20	B 3.9-25
	B 3.3-99	B 3.4-49	B 3.7-12	B 3.8-21	

BASES

ACTIONS

A.1 (continued)

possible, the borated water source should be a highly concentrated solution, such as that normally found in the boric acid storage tank, or the refueling water storage tank. The operator should borate with the best source available for the plant conditions.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

In MODES 2 (with k_{eff} < 1.0), 3, 4 and 5, the SDM is verified by performing a reactivity balance calculation, considering the listed reactivity effects:

a. RCS boron concentration;

b. Shutdown and Control bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

Using the ITC accounts for Doppler reactivity in this calculation because the reactor is subcritical, and the fuel temperature will be changing at the same rate as the RCS.

In the event that a rod is known to be untrippable, however, SDM verification must account for the worth of the untrippable rod as well as another rod of maximum worth.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS

B.1 (continued)

this status, the plant must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then the boration required by LCO 3.1.1 Required Action A.1 would occur. The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made, considering that other core conditions are fixed or stable, including control rod position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 as an initial check on core conditions and design calculations at BOC. The SR is modified by a Note. The Note requires that the normalization of predicted core reactivity to the measured value must take place within the first 60 effective full power days (EFPD) after each fuel loading. However, if the deviation between measured and predicted values is within the associated measurement and analytical uncertainties, it is not necessary to normalize the predicted core reactivity. This allows sufficient time for core conditions to reach steady state, but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. The required subsequent Frequency, following the initial 60 EFPD after entering MODE 1, is controlled under the the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26, GDC 28, and GDC 29.

2. FSAR, Chapter 15.

BASES

ACTIONS (continued)

D.2

If more than one rod is found to be misaligned or becomes misaligned because of bank movement, the unit conditions fall outside of the accident analysis assumptions. Since automatic bank sequencing would continue to cause misalignment, the unit must be brought to a MODE or Condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours.

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.4.2

Verifying each control rod is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each control rod would result in radial or axial power tilts, or oscillations. Exercising each individual control rod provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each control rod by 10 steps will not cause radial or axial power tilts, or oscillations, to occur. The Frequency takes into consideration other information available to the operator in the control room and SR 3.1.4.1, which is performed more frequently and adds to the determination of OPERABILITY of the rods. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Between or during required performances of SR 3.1.4.2 (determination of control rod OPERABILITY by movement), if a control rod(s) is discovered to be immovable, but remains trippable, the control rod(s) is considered to be OPERABLE until the surveillance interval expires. At any time, if a control rod(s) is immovable, a determination of the trippability (OPERABILITY) of the control rod(s) must be made, and appropriate action taken.

(continued)

BASES

ACTIONS

A.1.1, A.1.2 and A.2 (continued)

The allowed Completion Time of 2 hours provides an acceptable time for evaluating and repairing minor problems without allowing the plant to remain in an unacceptable condition for an extended period of time.

B.1

If the shutdown banks cannot be restored to within their insertion limits within 2 hours, the unit must be brought to MODE 3 where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that the shutdown banks are within their insertion limits prior to an approach to criticality ensures that when the reactor is critical, or being taken critical, the shutdown banks will be available to shut down the reactor, and the required SDM will be maintained following a reactor trip. This SR and Frequency ensure that the shutdown banks are within limits during a unit startup and subsequent operation.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10, GDC 26, and GDC 28.
2. 10 CFR 50.46.
3. FSAR, Chapter 15.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

This Surveillance is required to ensure that the reactor does not achieve criticality with the control banks below their insertion limits.

The estimated critical condition (ECC) depends upon a number of factors, one of which is xenon concentration. If the ECC was calculated long before criticality, xenon concentration could change to make the ECC substantially in error. Conversely, determining the ECP immediately before criticality could be an unnecessary burden. There are a number of unit parameters requiring operator attention at that point. Performing the ECC calculation within 4 hours prior to criticality avoids a large error from changes in xenon concentration, but allows the operator some flexibility to schedule the ECC calculation with other startup activities.

SR 3.1.6.2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.6.3

There is a potential that, with only a limit on rod insertion, the RCCAs could be placed in a sequence or overlap position, perhaps during troubleshooting activities or other abnormal plant conditions, that would violate core flux peaking factors while still satisfying the limits on rod insertion. This scenario is most likely to occur at reduced power following an automatic runback or due to an administrative power reduction in response to some rod control abnormality.

This surveillance ensures that the rod configuration across the core for any given operating condition will not result in unanalyzed peaking factors. The surveillance is not designed to test or verify the function of the Rod Control sequence and overlap circuits. In practice, this surveillance will be satisfied as long as the rod positions are in the positions specified in the COLR, regardless of the operability of the sequence and overlap circuits. The intent is to check the rod position to verify that the rods are in the expected positions as described in the COLR. If all rods are out of the core when the check is made, then rod sequence and overlap limits are satisfied for the purpose of this surveillance. At all power levels, the rod positions should conform to the requirements of the COLR for rod sequence and overlap. Implicit within the LCO is the assumption that bank sequence and overlap must be maintained during rod movement. When control banks are maintained within their insertion limits as checked by SR 3.1.6.2 above, it is unlikely that their sequence and overlap will not be in accordance with

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.1.6.3 (continued) requirements provided in the COLR. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. 10 CFR 50, Appendix A, GDC 10, GDC 26, GDC 28. 2. 10 CFR 50.46. 3. FSAR, Chapter 15.

BASES

ACTIONS (continued)

B.1

When THERMAL POWER is > 5% RTP, the only acceptable action is to open the reactor trip breakers (RTBs) to prevent operation of the reactor beyond its design limits. Immediately opening the RTBs will shut down the reactor and prevent operation of the reactor outside of its design limits.

C.1

When the RCS lowest operating loop T_{avg} is < 541°F, the appropriate action is to restore T_{avg} to within its specified limit. The allowed Completion Time of 15 minutes provides time for restoring T_{avg} to within limits without allowing the plant to remain in an unacceptable condition for an extended period of time. Operation with the reactor critical and with temperature below 541°F could violate the assumptions for accidents analyzed in the safety analyses.

D.1

If the Required Actions cannot be completed within the associated Completion Time, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within an additional 15 minutes. The Completion Time of 15 additional minutes is reasonable, based on operating experience, for reaching MODE 3 in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

The power range and intermediate range neutron detectors must be verified to be OPERABLE in MODE 2 by LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." A CHANNEL OPERATIONAL TEST is performed on each power range and intermediate range channel prior to initiation of the PHYSICS TESTS. This will ensure that the RTS is properly aligned to provide the required degree of core protection during the performance of the PHYSICS TESTS.

SR 3.1.8.2

Verification that the RCS lowest operating loop T_{avg} is ≥ 541°F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.3

Verification that the THERMAL POWER is ≤ 5% RTP will ensure that the plant is not operating in a condition that could invalidate the safety analyses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.8.4

Verification that the SDM is within limits specified in the COLR ensures that, for the specific RCCA and RCS temperature manipulations performed during PHYSICS TESTS, the plant is not operating in a condition that could invalidate the safety analysis assumptions. The SDM verification can be facilitated through the use of tables prepared by the core designers in which the reactivity effects expected during the Physics Testing have been previously considered.

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration;

b. Shutdown and Control bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

Using the ITC accounts for Doppler reactivity in this calculation because the reactor is subcritical, and the fuel temperature will be changing at the same rate as the RCS.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1 (continued)

The limit with which $F_Q^C(Z)$ is compared varies inversely with power above 50% RTP and directly with a function called K(Z) provided in the COLR.

Performing this Surveillance in MODE 1 prior to exceeding 75% RTP, provides assurance that the $F_Q^C(Z)$ limit is met when RTP is achieved, because peaking factors generally decrease as power level is increased.

If THERMAL POWER has been increased by ≥ 20% RTP since the last determination of $F_Q^C(Z)$, another evaluation of this factor is required 24 hours after achieving equilibrium conditions at this higher power level (to ensure that $F_Q^C(Z)$ values are being reduced sufficiently with power increase to stay within the LCO limits).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.2.1.2

The nuclear design process includes calculations performed to determine that the core can be operated within the $F_Q(Z)$ limits. Because power distribution measurements are taken at or near equilibrium conditions, the variations in power distribution resulting from normal operational maneuvers are not present in the core power distribution measurement data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation. The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor, $F_Q^C(Z)$, by W(Z) gives the maximum $F_Q(Z)$ calculated to occur in normal operation, $F_Q^W(Z)$.

The limit with which $F_Q^W(Z)$ is compared varies inversely with power above 50% RTP and directly with the function K(Z) provided in the COLR.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.2 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.46, 1974.
2. Regulatory Guide 1.77, Rev. 0, May 1974.
3. 10 CFR 50, Appendix A, GDC 26.
4. RXE-90-006-P-A, "Power Distribution Control Analysis and Overtemperature N-16 and Overpower N-16 Trip Setpoint Methodology," TU Electric, June 1994.
5. WCAP-7308-L-P-A, "Evaluation of Nuclear Hot Channel Factor Uncertainties," June 1988.
6. WCAP-10216-P-A, Rev. 1A, "Relaxation of Constant Axial Offset Control (and) FQ Surveillance Technical Specification," February 1994.
7. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Regulatory Guide 1.77, Rev. 0, May 1974.
2. 10 CFR 50, Appendix A, GDC 26.
3. 10 CFR 50.46.
4. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

LCO (continued)

detector well. For convenience, this flux difference is converted to provide flux difference units expressed as a percentage and labeled as %Δ flux or %ΔI.

The AFD limits are provided in the COLR. The AFD limits for RAOC do not depend on the target flux difference. However, the target flux difference may be used to minimize changes in the axial power distribution.

Violating the LCO on the AFD could produce unacceptable consequences if a Condition 2, 3, or 4 event occurs while the AFD is outside its limits.

APPLICABILITY

The AFD requirements are applicable in MODE 1 greater than or equal to 50% RTP, when the combination of THERMAL POWER and core peaking factors are the core parameters of primary importance in safety analyses (Ref. 1).

For AFD limits developed using RAOC methodology, the value of the AFD does not affect the limiting accident consequences with THERMAL POWER < 50% RTP and for lower operating power MODES.

ACTIONS

A.1

As an alternative to restoring the AFD to within its specified limits, Required Action A.1 requires a THERMAL POWER reduction to < 50% RTP. This places the core in a condition for which the value of the AFD is not important in the applicable safety analyses. A Completion Time of 30 minutes is reasonable, based on operating experience, to reach 50% RTP without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

This Surveillance verifies that the AFD as indicated by the NIS excore channels is within its specified limits. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS

A.6 (continued)

RTP within 24 hours but is increased slowly, then the peaking factor surveillances must be performed within 48 hours after increasing THERMAL POWER above the limit of Required Action A.1. This Completion Time is intended to allow adequate time to increase THERMAL POWER to above the limits of Required Action A.1, while not permitting the core to remain with unconfirmed power distributions for extended periods of time.

Required Action A.6 is modified by a Note that states that the peaking factor surveillances must be completed when the excore detectors have been normalized to restore QPTR to within limit (i.e., Required Action A.5). The intent of this Note is to have the peaking factor surveillances performed at operating power levels, which can only be accomplished after the excore detectors are normalized to restore QPTR to within limit.

B.1

If Required Actions A.1 through A.6 are not completed within their associated Completion Times, the unit must be brought to a MODE or condition in which the requirements do not apply. To achieve this status, THERMAL POWER must be reduced to < 50% RTP within 4 hours. The allowed Completion Time of 4 hours is reasonable, based on operating experience regarding the amount of time required to reach the reduced power level without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1

SR 3.2.4.1 is modified by two Notes. Note 1 allows QPTR to be calculated with three power range channels if THERMAL POWER is ≤ 75% RTP and the input from one Power Range Neutron Flux channel is inoperable. Note 2 allows performance of SR 3.2.4.2 in lieu of SR 3.2.4.1

This Surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) excore channels, is within its limits. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

For those causes of QPT that occur quickly (e.g., a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.4.2

This Surveillance is modified by a Note, which states that it is not required until 12 hours after the inputs from one or more Power Range Neutron Flux channels are inoperable and the THERMAL POWER is > 75% RTP.

With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

For purposes of monitoring the QPTR when one power range channel is inoperable, the moveable incore detectors or an OPERABLE PDMS may be used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. When using the moveable incore detector system, the incore detector monitoring is performed with a full incore flux map or two sets of four thimble locations with quarter core symmetry. The two sets of four symmetric thimbles is a set of eight unique detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, and N-8.

The symmetric thimble flux map can be used to generate symmetric thimble "tilt." This can be compared to a reference symmetric thimble tilt, from the most recent full core flux map, to generate an incore QPTR. Therefore, incore monitoring of QPTR can be used to confirm that QPTR is within limits.

With one NIS channel inoperable, the indicated tilt may be changed from the value indicated with all four channels OPERABLE. To confirm that no change in tilt has actually occurred, which might cause the QPTR limit to be exceeded, the incore result may be compared against previous core power distribution measurements using an OPERABLE PDMS and the symmetric thimbles as described above or a complete flux map. Nominally, quadrant tilt from the Surveillance should be within 2% of the tilt shown by the most recent flux map data.

REFERENCES

1. 10 CFR 50.46.
2. Regulatory Guide 1.77, Rev 0, May 1974.
3. 10 CFR 50, Appendix A, GDC 26.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The SRs for each RTS Function are identified by the SRs column of Table 3.3.1-1 for that Function.

A Note has been added to the SR Table stating that Table 3.3.1-1 determines which SRs apply to which RTS Functions.

Note that each channel of process protection supplies both trains of the RTS. When testing Channel I, Train A and Train B must be examined. Similarly, Train A and Train B must be examined when testing Channel II, Channel III, and Channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.1.1

Performance of the CHANNEL CHECK ensures that 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 two 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 that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit 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 sensor or the signal processing equipment has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the NIS and N-16 power indications. If the calorimetric exceeds the NIS or N-16 power indications by more than +2% RTP, the affected NIS and N-16 functions are not declared inoperable, but the channel gains must be adjusted consistent with the calorimetric power. If the NIS or N-16 channel outputs cannot be properly adjusted, the channel is declared inoperable.

If the NIS and N-16 power indications are normalized to within 2% RTP of the calorimetric power, and reactor power is then reduced, the NIS power

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2 (continued)

feedwater venturi. While the measurement uncertainty remains constant in ΔP as power decreases, when translated into flow, the uncertainty increases as a square term. Thus, a 1% flow error at 100% power can approach a 10% flow error at 30% RTP event though the ΔP error has not changed.

An evaluation of extended operations at reduced power conditions would likely conclude that it is prudent to administratively adjust the setpoint of the Power Range Neutron Flux - High bistables to ≤ 90% RTP when: 1) the Power Range channel output is adjusted in the decreasing power direction due to a reduced power venturi-based calorimetric below 55% RTP; or 2) for a post refueling startup (consistent with the Bases for SR 3.4.1.4). The evaluation of extended operation at reduced power conditions would also likely conclude that the potential need to adjust the indication of the Power Range Neutron Flux in the decreasing power direction is quite small, primarily to address operation in the intermediate range about P-10 (nominally 10% RTP) to allow enabling of the Power Range Neutron Flux - Low setpoint and the Intermediate Range Neutron Flux reactor trips. Before the Power Range Neutron Flux - High bistables are reset to their nominal value high setpoint, the NIS or N-16 power indication adjustment must be confirmed based on LEFM-based calorimetric or on a venturi-based calorimetric performed at ≥ 55% RTP.

The Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours are allowed for performing the first Surveillance after reaching 15% RTP. A power level of 15% RTP is chosen based on plant stability; i.e., the turbine generator is synchronized to the grid and rod control is in the automatic mode. The 24-hour allowance after increasing THERMAL POWER above 15% RTP provides a reasonable time to attain a scheduled power plateau, establish the requisite conditions, perform the required calorimetric measurement and make any required adjustments in a controlled, orderly manner and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be acceptable for subsequent use.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. The excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This Surveillance is performed to verify the f(Δq) input to the overtemperature N-16 Function.

A Note clarifies that the Surveillance is required only if reactor power is ≥ 50% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 50% RTP. The Note allows power ascensions and associated testing to be conducted in a controlled and orderly manner, at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be OPERABLE. Due to such effects as shadowing from the relatively deep control rod insertion and, to a lesser extent, the dependency of the axially-dependent radial leakage on the power level, the relationship between the incore and excore indications of axial flux difference (AFD) at lower power levels is variable. Thus, it is acceptable to defer the calibration of the excore AFD against the incore AFD until more stable conditions are attained (i.e, withdrawn control rods and a higher power level). The AFD is used as an input to the Overtemperature N-16 reactor trip function and for assessing compliance with LCO 3.2.3, "Axial Flux Difference." Due to the DNB benefits gained by administratively restricting the power level to 50% RTP, no limits on AFD are imposed below 50% RTP by LCO 3.2.3; thus, the proposed change is consistent with the LCO 3.2.3 requirements below 50% RTP. Similarly, sufficient DNB margins are realized through operation below 50% RTP that the intended function of the Overtemperature N-16 reactor trip function is maintained, even though the excore AFD indication may not exactly match the incore AFD indication. Based on plant operating experience, 24 hours is a reasonable time frame to limit operation above 50% RTP while completing the procedural steps associated with the surveillance in an orderly manner.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT. This test shall verify OPERABILITY by actuation of the end devices. The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test shall include a local manual shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.4 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the core power distribution measurement. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the core power distribution measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(Δq) input to the overtemperature N-16 Function.

A Note modifies SR 3.3.1.6. The Note states that this Surveillance is required only if reactor power is ≥ 75% RTP and that 72 hours is allowed for performing the first surveillance after reaching equilibrium conditions at a THERMAL POWER ≥ 75% RTP. The SR is deferred until a scheduled testing plateau above 75% is attained during the post-outage power ascension. During a typical post-refueling power ascension, it is usually necessary to control the axial flux difference at lower power levels through control rod insertion. Due to rod shadowing effects and, to a lesser degree, the dependency of the axially-dependent radial leakage on the power level, the incore-excore AFD relationship well below 75% RTP may differ excessively from the incore-excore axial flux difference relationship at full power. Excore calibration adjustments should be based on the incore-excore multipoint relationship established above 75% RTP by use of the developed calibration standard equations or by initiating an AFW swing and performing a direct multipoint measurement. After equilibrium conditions are achieved at the specified power plateau, a full core flux map must be taken, and the required data collected. The data is typically analyzed and the appropriate excore calibrations are completed within 48 hours after achieving equilibrium conditions. An additional time allowance of 24 hours is provided during which the effects of equipment failures may be remedied and any required re-testing may be performed.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.6 (continued)

The allowance of 72 hours after equilibrium conditions are attained at the testing plateau provides sufficient time to allow power ascensions and associated testing to be conducted in a controlled and orderly manner, at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be acceptable for subsequent use. The benefit gained by operating at reduced power levels is sufficient to offset potential differences between the incore and excore indications of Δq prior to completion of this surveillance.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT. A COT is performed on each required channel to ensure the channel will perform the intended Function.

Setpoints must be within the Allowable Values specified in Table 3.3.1-1.

SR 3.3.1.7 is modified by two Notes. Note 1 provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3. Note 2 requires that the quarterly COT for the source range instrumentation include verification by observation of the associated permissive annunciator window that the P-6 and P-10 interlocks are in their required state for the existing unit conditions.

SR 3.3.1.7 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.1-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, and it is modified by the same Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit conditions. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed e.g., by observation of the associated permissive annunciator window, within the Frequency specified in the Surveillance Frequency Control Program prior to reactor startup, up to 12 hours after reducing power below P-10, and four hours after reducing power below P-6, as discussed below. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "12 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup, 12 hours after reducing power below P-10, and four hours after reducing power below P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 for more than 12 hours or < P-6 for more than 4 hours,

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.8 (continued)

then the testing required by this surveillance must be performed prior to the expiration of the 12 hour or 4 hour limit, as applicable. These time limits are reasonable, based on operating experience, to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for the periods discussed above. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that excludes verification of setpoints from the TADOT. Since this SR applies to RCP undervoltage and underfrequency relays, setpoint verification requires elaborate bench calibration and is accomplished during the CHANNEL CALIBRATION.

SR 3.3.1.10

CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

This SR is modified by Note 1 stating that N-16 detectors are excluded from the CHANNEL CALIBRATION because the unit must be in at least MODE 1 to obtain N-16 indications. However, after achieving equilibrium conditions in MODE 1, detector plateau curves should be obtained, evaluated and compared to manufacturer's data.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint methodology.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.10 is modified by Note 2 stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable. This surveillance does not include verification of time delay relays. These relays are verified via response time testing per SR 3.3.1.16. Whenever an RTD is replaced in Functions 6 or 7, the next

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.10 (continued)

required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares other sensing elements with the recently installed element.

The SR is modified by Note 3 stating that, prior to entry into MODES 2 or 1, power and intermediate range detector plateau verification is not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP.

SR 3.3.1.10 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.1-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note (r) requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. For the intermediate and power range channels, detector plateau curves are obtained, evaluated and compared to manufacturer's data. For the source range neutron detectors, performance data is obtained and evaluated. Note 3 states that, prior to entry into MODES 2 or 1, the power and intermediate

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.11 (continued)

range detector plateau voltage verification is not required to be current until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 90% RTP. Equilibrium conditions are achieved when the core is sufficiently stable at intended operating conditions to perform a meaningful detector plateau voltage verification. The allowance of 72 hours after equilibrium conditions are attained at the testing plateau provides sufficient time to allow power ascension testing to be conducted in a controlled and orderly manner at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be OPERABLE for subsequent use. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.11 is modified by Note 2 stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable. This surveillance does not include verification of time delay relays. These relays are verified via response time testing per SR 3.3.1.16.

SR 3.3.1.12

Not Used.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, and the SI Input from ESFAS, and the Reactor Trip Bypass Breaker undervoltage trip mechanisms.

The Manual Reactor Trip TADOT shall independently verify the OPERABILITY of the handswitch undervoltage and shunt trip contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip mechanism.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.14 (continued)

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. This TADOT is as described in SR 3.3.1.4, except that this test is performed prior to exceeding the P-9 interlock whenever the unit has been in MODE 3. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock.

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. The required trip initiation signals and acceptance criteria for response time testing are included in Technical Requirements Manual, (Ref. 6). No credit was taken in the safety analyses for those channels with response time listed as N.A. No response time testing requirements apply where N.A. is listed in the TRM. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor until loss of stationary gripper coil voltage.

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function time constants set at their nominal values.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Response time verification in lieu of actual testing may be performed on RTS components in accordance with reference 10.

SR 3.3.1.16 is modified by a Note stating that neutron and N-16 gamma

(continued)

BASES

ACTIONS

L.1, L.2.1 and L.2.2 (continued)

With one or more required channel(s) inoperable, the operator must verify that the interlock is in the required state for the existing unit condition by observation of the permissive annunciator windows. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 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. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks.

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS Function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV. The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.2.1

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 two 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1 (continued)

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and reliability. 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.3

Not used.

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. The time allowed for the testing (4 hours) is justified in Reference 6. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.5 (continued)

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint calculation. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint calculation.

SR 3.3.2.5 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.2-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.6 (continued)

check of the circuit containing contacts operated by the slave relay. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

For ESFAS slave relays and auxiliary relays which are Westinghouse type AR relays, the slave relay reliability assessment presented in Reference 10 is relay specific and applies only to Westinghouse type AR relays with AC coils. Note that, for normally energized applications, the relays may require periodic replacement in accordance with the guidance given in Reference 10.

SR 3.3.2.7

SR 3.3.2.7 is the performance of a TADOT. This test is a check of the Loss of Offsite Power Function.

The SR is modified by a Note that excludes verification of setpoints for relays. Relay setpoints require elaborate bench calibration and are verified during CHANNEL CALIBRATION. The SR is modified by a second note that excludes the actuation of final devices from the surveillance testing. The start of the auxiliary feedwater pumps during this SR is unnecessary as these pumps are adequately tested by the SRs for LCO 3.7.5. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and AFW pump start on trip of all MFW pumps. The Safety Injection TADOT shall independently verify the OPERABILITY of the handswitch undervoltage and shunt trip contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers as well as the contacts for safety injection actuation. As a minimum, each Manual Actuation Function is tested up to, but not including, the master relay coils. This test overlaps with the master relay coil testing performed in accordance with SR 3.3.2.4. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.2.9 (continued)

A CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.9 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.2-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note (r) requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.10 (continued)

Response Time testing, required channels, and acceptance criteria are included in the Technical Requirements Manual (Ref. 7). For each Functional Unit to which this SR applies, at least one ESF function has a required response time but not necessarily all associated ESF functions. No credit was taken in the safety analyses for those channels with response time listed as N.A. When the response time for a function in the TRM is NA, no specific testing need be performed to comply with this SR. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time testing may be performed with the transfer functions set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Response time verification in lieu of actual testing may be performed on ESFAS components in accordance with reference 11.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 532 psig in the SGs.

SR 3.3.2.11

SR 3.3.2.11 is the performance of a TADOT as described in SR 3.3.2.8, except that it is performed for the P-4 Reactor Trip Interlock. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

If the Required Action and associated Completion Time of Condition C is not met and Table 3.3.3-1 directs entry into Condition E, the unit must be brought to a MODE where the requirements of this LCO do not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and MODE 4 within 12 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.

F.1

Alternate means of monitoring Reactor Vessel Water Level and Containment Area Radiation have been developed. These alternate means may be temporarily used if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the unit but rather to follow the directions of Specification 5.6.8, in the Administrative Controls section of the TS. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that SR 3.3.3.1 and SR 3.3.3.3 apply to each PAM instrumentation Function in Table 3.3.3-1.

SR 3.3.3.1

Performance of the CHANNEL CHECK ensures that a gross instrumentation failure 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 two 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1 (continued)

Agreement criteria are determined by the unit 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. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

As specified in the SR, a CHANNEL CHECK is only required for those channels that are normally energized. All of the instruments listed in Table 3.3.3-1 are normally energized.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.3.2

Deleted

SR 3.3.3.3

CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. The calibration method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." Whenever an RTD is replaced in Function 3 or 4, the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares other sensing elements with the recently installed element. Whenever a core exit thermocouple replaced in Functions 15 thru 18, the next required CHANNEL CALIBRATION of the core exit thermocouples is accomplished by an in-place cross calibration that compares the other sensing elements with the recently installed sensing element. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Containment Radiation Level (High Range) CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/hr and a one point calibration check of the detector below 10R/hr with an installed or portable gamma source.

(continued)

BASES

ACTIONS

A.1 (continued)

The Required Action is to restore the required Function and required HSP controls to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

B.1 and B.2

If the Required Action and associated Completion Time of Condition A is not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 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 3.3.4.1

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 two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. 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.

As specified in the Surveillance, a CHANNEL CHECK is only required for those channels which are normally energized. With the exception of the charging pump to CVCS and RCP seals flow indication, all instruments listed in Table 3.3.4-1 are normally energized. The channels (recorders) for the RCS Hot Leg Temperature and RCS Cold Leg Temperature functions may be de-energized during non-use with capability to be energized to obtain the necessary reading.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.4.2

SR 3.3.4.2 verifies each required Remote Shutdown System HSP power and control circuit and transfer switch performs the intended function. This verification is performed from the Hot Shutdown Panel and locally, as appropriate. Operation of the equipment from the remote shutdown 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 unit can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.4.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an in-place cross calibration that compares the other sensing elements with the recently installed sensing element. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 3 and 19.
2. FSAR Section 7.4

BASES

ACTIONS (continued)

F.1

Condition F applies when one or more trains of Automatic Actuation Logic and Actuation Relay function are inoperable.

Required Action F.1 requires restoring the inoperable train(s) to OPERABLE status. The 1 hour completion Time allows time to repair failures and takes into account the low probability of an event requiring LOP DG start occurring during this interval.

G.1

Condition G applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Conditions A through F are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources - Operating," for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

SR 3.3.5.1 is the performance of an ACTUATION LOGIC TEST. The LOP DG Start Automatic Actuation Logic and Actuation Relays are tested prior to entering MODE 4 when in MODE 5 for greater than or equal to 72 hours and if not performed in the previous 92 days. The Function is tested prior to entering MODE 4 to assure that the associated diesel generator is not unnecessarily started by the testing. Such unnecessary starts could be adverse to the reliability of the diesel generator. The testing verifies that the logic is OPERABLE. The Frequency of the testing is adequate. The 72 hours assures that there is sufficient time during the shutdown to perform the testing. The 92 days is based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.5.2

SR 3.3.5.2 is the performance of a TADOT. This test is performed prior to entry into MODE 4 when in MODE 5 for ≥ 72 hours and if not performed in previous 92 days. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.3

SR 3.3.5.3 is the performance of a CHANNEL CALIBRATION.

CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.4

SR 3.3.5.4 is the performance of the required response time verification (see also SR 3.3.2.10) on those functions with time limits provided in the Technical Requirements Manual. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 8.3.

2. FSAR, Chapter 15.

BASES

ACTIONS (continued)

B.1 (continued)

If a train is inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action for the applicable Conditions of LCO 3.6.3 is met for each valve made inoperable by failure of isolation instrumentation.

A Note is added to allow the containment pressure relief valves to be opened in compliance with the gaseous effluent monitoring instrumentation requirements in Part I of the ODCM, for Required Action and associated Completion Time of Condition A not met.

A Note is added stating that Condition B is only applicable in MODE 1, 2, 3, or 4.

C.1 and C.2

Condition C applies to the inability to restore the radiation monitoring channel to OPERABLE status in the time allowed for Required Action A.1. If the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action to place and maintain containment ventilation isolation valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. A note allows the containment pressure relief valves to be opened in compliance with gaseous effluent monitoring instrumentation requirements in Part I of the ODCM. The Completion Time for these Required Actions is Immediately.

A Note states that Condition C is applicable during CORE ALTERATIONS and during movement of irradiated fuel assemblies within containment.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Ventilation Isolation Functions.

SR 3.3.6.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.2

SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.4

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. This test verifies the capability of the instrumentation to provide the containment purge and exhaust system isolation. The setpoint shall be left consistent with the current calibration procedure tolerance.

SR 3.3.6.5

SR 3.3.6.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.5 (continued)

check of the circuit containing contacts operated by the slave relay. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

For ESFAS slave relays and auxiliary relays which are Westinghouse type AR relays, the SLAVE RELAY TEST based on the slave relay reliability assessment presented in Reference 3. This reliability assessment is relay specific and applies only to Westinghouse type AR relays with AC coils. Note that, for normally energized applications, the relays may require periodic replacement in accordance with the guidance given in Reference 3.

SR 3.3.6.6

Not Used.

SR 3.3.6.7

CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 100.11.

2. NUREG-1366, July 22, 1993.

3. WCAP-13877-P-A, Revision 2, August 2000.

4. WCAP-15376-P-A, Revision 2, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," March 2003.

BASES

ACTIONS (continued)

D.1 and D.2

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met during MODE 5 or 6 or when irradiated fuel assemblies are being moved. Movement of irradiated fuel assemblies and CORE ALTERATIONS must be suspended immediately to reduce the risk of accidents that would require CREFS actuation

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1 determines which SRs apply to which CREFS Actuation Functions.

SR 3.3.7.1

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 two 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 unit 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 sensor or the signal processing equipment has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.7.2

A COT is performed on each required channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the CREFS actuation. The setpoints shall be left consistent with the unit specific calibration procedure tolerance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The COT surveillance of the control room air intake monitors verifies the contacts and circuitry between the monitors and the CREFs actuation circuits, and thereby satisfies the COT for Automatic Actuation Logic and Actuation Relays.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.3

Not Used.

SR 3.3.7.4

Not Used.

SR 3.3.7.5

Not Used.

SR 3.3.7.6

SR 3.3.7.6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device.

The test also includes trip devices that provide actuation signals directly to the Solid State Protection System, bypassing the analog process control equipment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

SR 3.3.7.7

CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR Section 6.4.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.1.2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.1.3

The indication for this parameter indicates in percent (%). The value in % that will assure compliance with the minimum total flow limit in the SR is determined based on the measured RCS total flow from SR 3.4.1.4. Prior to the completion of SR 3.4.1.4, the value in % used to assure compliance with the minimum RCS total flow is based upon the measured RCS total flow (SR 3.4.1.4) from the previous operating cycle or an alternate measurement and assessment of actual RCS total flow. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.1.4

Measurement of RCS total flow rate by performance of a precision calorimetric heat balance allows the installed RCS flow instrumentation to be normalized and verifies the actual RCS flow rate is greater than or equal to the minimum required RCS flow rate.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that allows entry into MODE 1, without having performed the SR, and placement of the unit in the best condition for performing the SR. The Note states that the SR is not required to be performed until after exceeding 85% RTP after each refueling outage. Using precision instrumentation with multiple indications, the stated RCS flow accuracy may be attained at power levels significantly below 85% RTP, as described in the uncertainty analyses. Requiring the precision flow measurement to be performed prior to 85% RTP allows for a single testing plateau to be used to perform the RCS flow measurement and various other tests described in Section 3.2. Procedures require that the THERMAL POWER, available instrumentation, and calibration intervals be sufficient to ensure that the stated RCS flow accuracy is attained. For feedwater pressure and temperature, the main steam pressure, and feedwater flow

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1

RCS loop average temperature is required to be verified at or above 551°F.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 15.

BASES

ACTIONS

C.1 and C.2 (continued)

ASME Code, Section XI, Appendix E (Ref. 7), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

Condition C is modified by a Note requiring Required Action C.2 to 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 3.4.3.1

Verification that operation is within the PTLR limits is required when RCS pressure and temperature conditions are undergoing planned changes. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Surveillance for heatup, cooldown, or ISLH testing may be discontinued when the definition given in the relevant plant procedure for ending the activity is satisfied.

This SR is modified by a Note that only requires this SR to be performed during system heatup, cooldown, and ISLH testing. No SR is given for criticality operations because LCO 3.4.2 contains a more restrictive requirement.

REFERENCES

1. Not used.
2. 10 CFR 50, Appendix G.
3. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
4. ASTM E 185-82, July 1982.
5. 10 CFR 50, Appendix H.
6. Regulatory Guide 1.99, Revision 2, May 1988.
7. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

BASES

APPLICABILITY (continued)

The decay heat production rate is much lower than the full power heat rate. As such, the forced circulation flow and heat sink requirements are reduced for lower, noncritical MODES as indicated by the LCOs for MODES 3, 4, and 5.

Operation in other MODES is covered by:

LCO 3.4.5, "RCS Loops - MODE 3";
LCO 3.4.6, "RCS Loops - MODE 4";
LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled";
LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled";
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level" (MODE 6); and
LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level" (MODE 6).

ACTIONS

A.1

If the requirements of the LCO are not met, the Required Action is to reduce power and bring the plant to MODE 3. This lowers power level and thus reduces the core heat removal needs and minimizes the possibility of violating DNB limits.

The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

This SR requires verification that each RCS loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal while maintaining the margin to DNB. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 15.

BASES

ACTIONS

D.1, D.2, and D.3 (continued)

coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR requires verification that the required loops are in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.5.2

SR 3.4.5.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is ≥38% (Unit 1) and ≥10% (Unit 2) for required RCS loops. If the SG secondary side narrow range water level is <38% (Unit 1) and <10% (Unit 2), the tubes may become uncovered and the associated loop may not be capable of providing the heat sink for removal of the decay heat. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.5.3

Verification that the required RCPs are OPERABLE ensures that safety analyses limits are met. The requirement also ensures that an additional RCP can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power availability to the required RCPs. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

None.

BASES

ACTIONS

B.1 and B.2 (continued)

criticality must not be reduced in this type of operation. Suspending the introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This SR requires verification that one RCS or RHR loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.6.2

SR 3.4.6.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is ≥38% (Unit 1) and ≥10% (Unit 2). If the SG secondary side narrow range water level is <38% (Unit 1) and <10% (Unit 2), the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.6.3

Verification that the required pump is OPERABLE ensures that an additional RCS or RHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

None.

BASES

ACTIONS

A.1 and A.2 (continued)

OPERABLE status or to restore the required SG secondary side water levels. Either Required Action A.1 or Required Action A.2 will restore redundant heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no RHR loop is in operation, except during conditions permitted by Notes 1 and 4, or if no loop is OPERABLE, all operations involving introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be suspended and action to restore one RHR loop to OPERABLE status and operation must be initiated. To prevent inadvertent criticality during a boron dilution, forced circulation from at least one RCP is required to provide proper mixing and preserve the margin to criticality in this type of operation. Suspending the introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Times reflect the importance of maintaining operation for heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification that the required loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are ≥38% (Unit 1) and ≥10% (Unit 2) ensures an alternate decay heat removal method via natural circulation in the event that the second RHR loop is not OPERABLE. If both RHR loops are OPERABLE, this Surveillance is not needed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.3

Verification that a second RHR pump is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the RHR pump. If secondary side water level is ≥38% (Unit1) and ≥10% (Unit 2) in at least two SGs, this Surveillance is not needed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. NRC Information Notice 95-35, "Degraded Ability of Steam Generators to Remove Decay Heat by Natural Circulation."

BASES

ACTIONS (continued)

B.1 and B.2

If no required RHR loops are OPERABLE or in operation, except during conditions permitted by Note 1, all operations involving introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be suspended and action must be initiated immediately to restore an RHR loop to OPERABLE status and operation. Boron dilution requires forced circulation for uniform dilution, and the margin to criticality must not be reduced in this type of operation. Suspending the introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must continue until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This SR requires verification that one loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.8.2

Verification that the required number of pumps are OPERABLE ensures that additional pumps can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

None.

BASES

ACTIONS

C.1 and C.2 (continued)

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 3.4.9.1

This SR requires that during steady state operation, pressurizer level is maintained below the nominal upper limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.9.2

The pressurizer heaters used to satisfy the pressure control function are comprised of one proportional control group and three backup groups. The heater groups are normally connected to the emergency power supplies (two to each Class 1E train of emergency power) and normally operate. The SR is satisfied when the power supplies are demonstrated to be capable of producing the minimum power and the associated pressurizer heaters are verified to be at their design rating. This may be done by testing the power supply output and by performing an electrical check on heater element continuity and resistance. This may also be done by energizing the heaters and measuring circuit current. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 15.
2. NUREG-0737, November 1980.
3. NUREG-1366, Improvements to Technical Specification Surveillance Requirements.

BASES

ACTIONS (continued)

G.1 and G.2

If the Required Actions of Condition F are not met, then 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 6 hours and to MODE 4 within 12 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. In MODES 4 5 and 6 (with the reactor vessel head on), automatic PORV OPERABILITY may be required. See LCO 3.4.12.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Block valve cycling verifies that the valve(s) can be opened and closed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. Note 1 modifies this SR by stating that it is not required to be performed with the block valve closed, in accordance with the Required Actions of this LCO. Opening the block valve in this condition increases the risk of an unisolable leak from the RCS since the PORV is already inoperable. Note 2 modifies this SR to allow entry into and operation in MODE 3 prior to performing the SR. This allows the surveillance to be performed in MODE 3 under operating temperature and pressure conditions, prior to entering MODE 1 or 2. In accordance with References 4, 5 and 6, administrative controls require this test be performed in MODES 3, 4 or 5 to adequately simulate operating temperature and pressure effects on PORV operation.

SR 3.4.11.2

SR 3.4.11.2 requires a complete cycle of each PORV. Operating a PORV through one complete cycle ensures that the PORV can be manually actuated for mitigation of an SGTR. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Note modifies this SR to allow entry into and operation in MODE 3 prior to performing the SR. This allows the surveillance to be performed in MODE 3 under operating temperature and pressure conditions, prior to entering MODE 1 or 2. In accordance with References 4, 5 and 6, administrative controls require this test be performed in MODES 3, 4 or 5 to adequately simulate operating temperature and pressure effects on PORV operation.

(continued)

BASES

ACTIONS

G.1 (continued)

The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of zero safety injection pumps and a maximum of two charging pumps are verified capable of injecting into the RCS and the accumulator discharge isolation valves are verified closed and locked out. Verification that each accumulator is isolated is only required when accumulator isolation is required as stated in Note 1 to the Applicability.

The safety injection pumps and charging pump are rendered incapable of injecting into the RCS, for example, through removing the power from the pumps by racking the breakers out under administrative control or by isolating the discharge of the pump by closed isolation valves with power removed from the operators or by a manual isolation valve secured in the closed position. Alternate methods of LTOP prevention may be employed to prevent a pump start such that a single failure will not result in an injection into the RCS. Providing pumps are rendered incapable of injecting into the RCS, they may be energized for purposes such as testing or for filling accumulators.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.4

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction isolation valves are open and by testing it in accordance with the Inservice Testing Program. This Surveillance is only required to be performed if the RHR suction relief valve is being used to meet this LCO.

The RHR suction isolation valves are verified to be opened. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.4 (continued)

The ASME Code (Ref. 8), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

SR 3.4.12.5

The RCS vent of ≥ 2.98 square inches is proven OPERABLE by verifying its open condition. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Any passive vent path arrangement must only be open when required to be OPERABLE. This Surveillance is required if the vent is being used to satisfy the pressure relief requirements of the LCO 3.4.12.

SR 3.4.12.6

The PORV block valve must be verified open to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This Surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.7

Not Used

SR 3.4.12.8

Performance of a COT is required within 12 hours after decreasing RCS temperature to ≤ 350°F on each required PORV to verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within the PTLR allowed maximum limits in the PTLR. PORV actuation could depressurize the RCS and is not required.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.8 (continued)

The 12 hour allowance considers the unlikelihood of a low temperature overpressure event during this time.

A Note has been added indicating that this SR is required to be performed 12 hours after decreasing RCS cold leg temperature to ≤ 350°F. The test must be performed within 12 hours after entering the LTOP MODES.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.9

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. FSAR, Chapter 15.
5. 10 CFR 50, Section 50.46.
6. 10 CFR 50, Appendix K.
7. Generic Letter 90-06.
8. ASME Code for Operation and Maintenance of Nuclear Power Plants.
9. FSAR, Chapter 5.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

the RCPB is maintained. Pressure boundary LEAKAGE would at first appear as unidentified LEAKAGE and can only be positively identified by inspection. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. Unidentified LEAKAGE and identified LEAKAGE are determined by performance of an RCS water inventory balance.

The RCS water inventory balance must be met with the reactor at steady state operating conditions (stable temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). This surveillance is modified by two Notes. Note 1 states that this SR is not required to be performed until 12 hours after establishing steady state operation near operating pressure. The 12 hour allowance provides sufficient time to collect and process necessary data after stable plant conditions are established.

Steady state operation is required to perform a proper inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows. An early warning of pressure boundary LEAKAGE or unidentified LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

Note 2 states that this SR is not applicable to primary to secondary LEAKAGE because LEAKAGE of 150 gallons per day cannot be measured accurately by an RCS water inventory balance.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program and recognizes the importance of early leakage detection in the prevention of accidents. When non steady state operation precludes surveillance performance, the surveillance should be performed in a reasonable time period commensurate with the surveillance performance length, once steady state operation has been achieved.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less than orequal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, the performance criterion is not met and LCO 3.4.17, "Steam Generator Tube Integrity," should be entered. The 150 gallons per day limit is measured at room temperature as described in Reference 8. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

The Surveillance is modified by a Note which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program and recognizes the importance of early leakage detection in the prevention of accidents. The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 8).

SURVEILLANCE REQUIREMENTS

1. 10 CFR 50, Appendix A, GDC 4 and 30.
2. Regulatory Guide 1.45, May 1973.
3. FSAR, Section 15.
4. FSAR, Section 3.6B.
5. NUREG-1061, Volume 3, November 1984.
6. 10 CFR 100.
7. NEI 97-06, "Steam Generator Program Guidelines".
8. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines".

BASES

ACTIONS

B.1 and B.2 (continued)

the containment. 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.

C.1

The inoperability of the RHR System interlock renders the RHR suction isolation valves capable of inadvertent opening at RCS pressures in excess of the RHR systems design pressure. If the RHR System interlock is inoperable, operation may continue as long as the affected RHR suction penetration is closed by at least one closed manual or deactivated automatic valve within 4 hours. This Action accomplishes the purpose of the function.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

Performance of leakage testing on each RCS PIV or isolation valve used to satisfy Required Action A.1 and Required Action A.2 is required to verify that leakage is below the specified limit and to identify each leaking valve. The leakage limit of 0.5 gpm per inch of nominal valve diameter up to 5 gpm maximum applies to each valve. Leakage testing requires a stable pressure condition greater than 150 psig.

For the two PIVs in series, the leakage requirement applies to each valve individually and not to the combined leakage across both valves. If the PIVs are not individually leakage tested, one valve may have failed completely and not be detected if the other valve in series meets the leakage requirement. In this situation, the protection provided by redundant valves would be lost.

Testing is to be performed every 9 months, but may be extended if the plant does not go into Mode 5 for at least 7 days. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

In addition, testing must be performed once after the check valve has been opened by flow or exercised to ensure tight reseating. PIVs disturbed in the performance of this Surveillance should also be tested unless documentation shows that an infinite testing loop cannot practically be avoided. Testing must be performed within 24 hours after the check valve has been reseated (except as provided by Note 1). Within 24 hours is a

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1 (continued)

reasonable and practical time limit for performing this test after opening or reseating a check valve.

The leakage limit is to be met at the RCS pressure associated with MODES 1 and 2. This permits leakage testing at high differential pressures with stable conditions not possible in the MODES with lower pressures.

Entry into MODES 3 and 4 is allowed to establish the necessary differential pressures and stable conditions to allow for performance of this Surveillance. The Note that allows this provision is complementary to the Frequency of prior to entry into MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months except for RHR isolation valves 8701A, 8701B, 8702A and 8702B. This exception is allowed since these RHR valves have control room position indication, inadvertent opening interlocks and a system high pressure alarm. In addition, this Surveillance is not required to be performed on the RHR System when the RHR System is aligned to the RCS in the shutdown cooling mode of operation. PIVs contained in the RHR shutdown cooling flow path must be leakage rate tested after RHR is secured and stable unit conditions and the necessary differential pressures are established.

SR 3.4.14.2

Verifying that the RHR System interlocks are OPERABLE ensures that RCS pressure will not overpressurize the RHR system. The interlock setpoint that prevents the valves from being opened is set so the actual RCS pressure must be $<$ 442 psig to open the valves. This setpoint ensures the RHR design pressure will not be exceeded and the RHR relief valves will not lift. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is not applicable when using the RHR System suction relief valves for cold overpressure protection in accordance with SR 3.4.12.7.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.
2. Regulatory Guide 1.45.
3. FSAR, Section 5.2.
4. NUREG-609, "Asymmetric Blowdown Loads on PWR Primary Systems," 1981.
5. Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops."
6. FSAR, Section 3.6B.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the noble gas specific activity of the reactor coolant. While basically a quantitative measure of radionuclides with half lives longer than 10 minutes, excluding iodines, this measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in noble gas specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

If a specific noble gas nuclide listed in the definition of DOSE EQUIVALENT XE-133 in Specification 1.1, "Definitions," is not detected, it should be assumed to be present at the minimum detectable activity.

The NOTE modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

SR 3.4.16.2

This Surveillance is performed in MODE 1 only to ensure iodine specific activity remains within the LCO limit during normal operation and following fast power changes when iodine spiking is more apt to occur. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The Frequency, between 2 and 6 hours after a power change $\geq$ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following iodine spike initiation; samples at other times would provide inaccurate results.

The NOTE modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

SR 3.4.16.3

DELETED

(continued)

BASES

ACTIONS (continued)

C.1 and C.2

If the accumulator cannot be returned to OPERABLE status 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 MODE 3 within 6 hours and RCS pressure reduced to ≤1000 psig within 12 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.

D.1

If more than one accumulator is inoperable, the plant is in a condition outside the accident analyses; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Each accumulator valve should be verified to be fully open every 12 hours. This verification ensures that the accumulators are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in not meeting accident analyses assumptions. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.1.2 and SR 3.5.1.3

Borated water volume and nitrogen cover pressure are verified for each accumulator. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Each accumulator is equipped with two level and two pressure channels. One channel of each is designated the primary channel and used for this surveillance except when declared inoperable. The second channel is used to perform channel checks and as backup to the primary channel. Surveillances are routinely performed on both channels.

Control Board indication may be used in the surveillances of the required indicated water volume. To allow for a 5% instrument inaccuracy and a 1% tank tolerance, control room indicated values of 39% and 61% are

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.2 and SR 3.5.1.3 (continued)

conservative and may be used in surveillance. Other means of surveillance which consider measurement uncertainty may also be used.

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator since the static design of the accumulators limits the ways in which the concentration can be changed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Sampling the affected accumulator within 6 hours after a 1% volume increase (101 gallons) will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the refueling water storage tank (RWST), and the RWST has not been diluted since verifying that its boron concentration satisfies SR 3.5.4.3, because the water contained in the RWST is nominally within the accumulator boron concentration requirements. This is consistent with the recommendation of NUREG-1366 (Ref. 6).

SR 3.5.1.5

Verification that power is removed from each accumulator isolation valve operator when the RCS pressure is > 1000 psig ensures that an active failure could not result in the undetected closure of an accumulator motor operated isolation valve. If this were to occur, only two accumulators would be available for injection given a single failure coincident with a LOCA. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR allows power to be supplied to the motor operated isolation valves when RCS pressure is ≤ 1000 psig.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable. Securing these valves in position by removal of power by a control board switch in the correct position ensures that they cannot change position as a result of an active failure or be inadvertently misaligned. These valves are of the type, described in References 6 and 7, that can disable the function of both ECCS trains and invalidate the accident analyses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. As noted in LCO Note 1, both Safety Injection pump flow paths may each be isolated for two hours in MODE 3 by closure of one or more of these valves to perform pressure isolation valve testing.

SR 3.5.2.2

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 actuation signal is allowed to be in a non-accident position provided the valve will automatically reposition within the proper stroke time. This Surveillance 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.3

Venting of the ECCS pump casing and accessible discharge piping high points prior to entering MODE 3 and following any maintenance or operations activity which drains portions of the system, ensures the system is full of water and will perform properly (i.e., allows injecting the full ECCS capacity into the RCS on demand).

The CCP design and attached piping configuration allow the CCP to vent the accumulated gases via the attached suction and discharge piping. Continuous venting of the suction piping to the Volume Control tank (VCT) and manual venting of the discharge piping high points satisfies the pump casing venting requirements for the CCPs.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. The following ECCS pumps are required to develop the indicated differential pressure on recirculation flow:

1)	Centrifugal charging pump	≥ 2370 psid,
2)	Safety injection pump	≥ 1440 psid, and
3)	RHR pump	> 170 psid.

This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. SRs are specified in the Inservice Testing Program of the ASME Code. The ASME Code and the Technical Requirements Manual provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.5 and SR 3.5.2.6

These Surveillances demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SI signal and that each ECCS pump starts on receipt of an actual or simulated SI signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.7

The correct alignment of throttle valves in the ECCS flow path on an SI signal is necessary for proper ECCS performance. Valves 8810A, B, C, D are provided in the charging pump to cold leg injection lines. Valves 8822A, B, C, D are provided in the SI pump to cold leg injection lines. These manual throttle valves are positioned following flow balancing and have mechanical locks to ensure that the proper positioning for restricted flow to a ruptured cold leg is maintained and that the other cold legs receive at least the required minimum flow. Valves 8816A, B, C, D are provided in the SI pump to hot leg recirculation lines. These manual throttle valves are positioned

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.7 (continued)

following flow balancing and have mechanical locks to ensure flow balancing and to limit SI pump runout. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.8

Periodic inspections of the containment sump suction inlet ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
2. 10 CFR 50.46.
3. FSAR, Sections 6.3 and 7.6.
4. FSAR, Chapter 15, "Accident Analysis."
5. NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
6. IE Information Notice No. 87-01.
7. BTP EICSB-18, Application of the Single Failure Criteria to Manually-Controlled Electrically-Operated Valves.

BASES

ACTIONS (continued)

B.1

With the RWST inoperable for reasons other than Condition A (e.g., water volume), it must be restored to OPERABLE status within 1 hour.

In this Condition, neither the ECCS nor the Containment Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the plant in a MODE in which the RWST is not required. The short time limit of 1 hour to restore the RWST to OPERABLE status is based on this condition simultaneously affecting redundant trains.

C.1 and C.2

If the RWST cannot be returned to OPERABLE status 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 6 hours and to MODE 5 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 3.5.4.1

The RWST borated water temperature should be verified to be within the limits assumed in the accident analyses band. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when ambient air temperatures are within the operating limits of the RWST. With ambient air temperatures within the band, the RWST temperature should not exceed the limits.

SR 3.5.4.2

The RWST water volume should be verified to be above the required minimum level in order to ensure that a sufficient initial supply is available for injection and to support continued ECCS and Containment Spray System pump operation on recirculation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Control Board indication may be used in the surveillances of the required indicated RWST water volume. The indicated level of 95%, which includes

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.4.2 (continued)

5% measurement uncertainty, is a conservative verification of contained volume. Other means of surveillance which consider measurement uncertainty may also be used.

SR 3.5.4.3

The boron concentration of the RWST should be verified to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.

BASES

ACTIONS (continued)

B.1 and B.2

When the Required Actions cannot be completed within the required Completion Time, a controlled shutdown must be initiated. The Completion Time of 6 hours for reaching MODE 3 from MODE 1 is a reasonable time for a controlled shutdown, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators. Continuing the plant shutdown begun in Required Action B.1, an additional 6 hours is a reasonable time, based on operating experience and normal cooldown rates, to reach MODE 4, where this LCO is no longer applicable.

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

The surveillance ensures the seal injection flow is less than 40 gpm with charging header pressure greater than or equal to 145 psig (130 psig + 15 psig for instrument uncertainty) above RCS pressure.

Verification the manual seal injection throttle valves are adjusted to give a flow within the limit ensures that proper manual seal injection throttle valve position, and hence, proper seal injection flow, is maintained. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

As noted, the Surveillance is not required to be performed until 4 hours after the RCS pressure has stabilized within a ± 20 psig range of normal operating pressure. The RCS pressure requirement is specified since this configuration will produce the required pressure conditions necessary to assure that the manual valves are set correctly. The exception is limited to 4 hours to ensure that the Surveillance is timely.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
2. 10 CFR 50.46.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leakage Rate Testing Program. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during initial air lock and containment OPERABILITY testing. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by the Containment Leakage Rate Testing Program.

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 has been added to this SR requiring the results to be evaluated against the acceptance criteria which is applicable to SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C containment leakage rate.

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports 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 opening of the inner and outer doors will not inadvertently occur. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix J, Option B.
2. FSAR, Section 6.2
3. FSAR, Section 15
4. FSAR, Section 3.8

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Each 48 inch Containment Purge and 12 inch Hydrogen Purge valve is required to be verified sealed closed. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a Containment Purge or Hydrogen Purge valve. These valves are not designed to be opened in MODES 1 to 4. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A Containment Purge or Hydrogen Purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.3.2

Not Used

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification through a system walkdown (which may include the use of local or remote indicators), that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed positions, since these were verified to be in the correct position upon locking, sealing, or securing.

The Note applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3 and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.5 (continued)

assumed in the FSAR [Ref. 2]. The isolation time and Frequency of this SR are in accordance with the Technical Requirements Manual and the Inservice Testing Program.

SR 3.6.3.6

Not used.

SR 3.6.3.7

The Containment Purge, Hydrogen Purge, and Containment Pressure Relief valves with resilient seals, are leakage rate tested per the requirements of 10 CFR 50, Apppendix J, Option B to ensure OPERABILITY.

The containment purge, hydrogen purge, and containment pressure relief valves are tested in accordance with the Containment Leakage Rate Testing Program. Leakage rate acceptance criteria applies as follows:

a. The inboard and outboard isolation valves with resilient material seals in each locked closed 48 inch containment purge and 12 inch hydrogen purge supply and exhaust penetration measured leakage rate is < 0.05 L_a when pressurized to P_a.

b. Each 18 inch containment pressure relief discharge isolation valve with resilient material seals measured leakage rate is < 0.06 L_a when pressurized to P_a.

The Note is a clarification that leakage rate testing is not required for containment purge valves with resilient seals when their penetration flow path is isolated by a leak tested blank flange. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each Phase "A" automatic containment isolation valve will actuate to its isolation position on a Phase "A" Isolation signal, each Phase "B" automatic containment isolation valve will actuate to its isolation position on a containment Phase "B" Isolation signal, and each pressure relief discharge valve actuates to its isolation position on a Containment Ventilation Isolation signal. This surveillance is not required for

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.8 (continued)

valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.3.9

Not used

SR 3.6.3.10

Not used.

SR 3.6.3.11

Not used.

SR 3.6.3.12

Not used.

SR 3.6.3.13

Not used.

REFERENCES

1. FSAR, Section 15.
2. FSAR, Section 6.2.
3. Standard Review Plan 6.2.4.
4. Not used
5. Multi-Plant Action MPA-B024, "Venting and Purging Containments While at Full Power and Effect of LOCA."
6. Technical Requirements Manual.
7. NUREG-0737, II.E.4.
8. BTP CSB 6-4.

(continued)

BASES

ACTIONS	B.1 and B.2 (continued) MODE 3 within 6 hours and to MODE 5 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 3.6.4.1 Verifying that containment pressure is within limits ensures that unit operation remains within the limits assumed in the containment analysis. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. FSAR, Section 6.2. 2. 10 CFR 50, Appendix K.

BASES

ACTIONS (continued)

B.1 and B.2

If the containment average air temperature cannot be restored to within its 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 6 hours and to MODE 5 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 3.6.5.1

Verifying that containment average air temperature is within the LCO limit ensures that containment operation remains within the limit assumed for the containment analyses. In order to determine the containment average air temperature, an adjusted average is calculated using two temperature measurements, on fixed or portable instruments. The temperature measurements are taken at the following locations: a) the containment dome, at or above Elevation 1000'-6"; b) the containment floor, at or above Elevation 860'-0". At least one of the temperatures must be taken at or above Elevation 1000'-6". The locations within the containment were selected to provide a representative sample of the overall containment atmosphere. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 6.2.
2. 10 CFR 50.49.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1

Verifying the correct alignment for manual, power operated, and automatic valves in the containment spray flow path provides assurance that the proper flow paths will exist for Containment Spray System 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. This SR does not require any testing or valve manipulation. Rather, it involves verification through a system walkdown (which may include the use of local or remote indicators), that those valves outside containment (only check valves are inside containment) and capable of potentially being mispositioned are in the correct position.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.6.2

Not Used

SR 3.6.6.3

Not Used

SR 3.6.6.4

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head (specified in the Technical Requirements Manual) ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by the ASME Code (Ref. 5). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow via a test header. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by abnormal performance. The Frequency of the SR is in accordance with the Inservice Testing Program.

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification that each automatic containment spray valve actuates to its correct position on an actual or simulated actuation of a containment “P” (High-3) signal and that each containment spray pump starts upon receipt of an actual or simulated actuation of a containment “S” (High-1) and “P” (High-3) pressure signals. This Surveillance is not required

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.5 and SR 3.6.6.6 (continued)

for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.6.7

Not Used

SR 3.6.6.8

With the containment spray inlet valves closed and the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, confirmation of operability following maintenance activities that can result in obstruction of spray nozzle flow is considered adequate to detect obstruction of the nozzles. Confirmation that the spray nozzles are unobstructed may be obtained by utilizing foreign materials exclusion (FME) controls during maintenance, a visual inspection of the affected portions of the system, or by an air or smoke flow test following maintenance involving opening portions of the system downstream of the containment isolation valves or draining of the filled portions of the system inside containment. Maintenance that could result in nozzle blockage is generally a result of a loss of foreign material control or a flow of borated water through a nozzle. Should either of these events occur, a supervisory evaluation will be required to determine whether nozzle blockage is a possible result of the event. For the loss of FME event, an inspection or flush of the affected portions of the system should be adequate to confirm that the spray nozzles are unobstructed since water flow would be required to transport any debris to the spray nozzles. An air flow or smoke test may not be appropriate for a loss of FME event but may be appropriate for the case where borated water inadvertently flows through the nozzles.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 38, GDC 39, GDC 40, GDC 41, GDC 42, and GDC 43.
2. 10 CFR 50, Appendix K.
3. FSAR, Section 6.2.1.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that MSIV closure time is ≤ 5 seconds. The hand switch may be used as the actuation signal to perform this surveillance. The MSIV isolation time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

The Frequency is in accordance with the Inservice Testing (IST) Program. This test is allowed to be conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

SR 3.7.2.2

This SR verifies that each MSIV can close on an actual or simulated main steam line isolation actuation signal. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This test is allowed to be conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

REFERENCES

1. FSAR, Section 10.3.
2. FSAR, Section 6.2.
3. FSAR, Chapter 15.
4. 10 CFR 100.11.

BASES

ACTIONS

E.1 and E.2 (continued)

Completion Time, 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 6 hours, and in MODE 4 within 12 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 3.7.3.1

This SR verifies that the closure time of each FIV, FCV, and associated bypass valves is ≤ 5 seconds. The FIV and FCV isolation times are assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. This is consistent with RG 1.22 (Ref. 4).

The Frequency for this SR is in accordance with the Inservice Testing Program. Per Ref. 5, if it is necessary to adjust stem packing to stop packing leakage and if a required stroke test is not practical in the current plant mode, it should be shown by analysis that the packing adjustment is within torque limits specified by the manufacturer for the existing configuration of packing, and that the performance parameters of the valve are not adversely affected. A confirmatory test must be performed at the first available opportunity when plant conditions allow testing. Packing adjustments beyond the manufacturer's limits may not be performed without (1) an engineering analysis and (2) input from the manufacturer, unless tests can be performed after adjustments.

SR 3.7.3.2

This SR verifies that each FIV and associated bypass valve can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. This SR 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 SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a note stating that one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator water level control, if it is capable of being manually realigned to the AFW mode of operation and provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable and applies only when the unit is below 10% RATED THERMAL POWER. Since AFW may be used during startup, shutdown, hot standby operations, and hot shutdown operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY is maintained. The ability to realign the affected AFW train(s) to a standby condition or to an in-service condition supplying feedwater to the steam generator(s) assures the intended safety function is available. Realignment of the AFW train(s)is normally performed from the Control Room. However, when explicitly allowed by Operations' procedure, this provision may also be applied to local manual operation of AFW valves.

SR 3.7.5.2

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by the ASME Code (Ref. 2). The motor driven pumps should develop a differential pressure of $\geq$ 1380 psid at a flow of $\geq$ 430 gpm. The turbine driven pump should develop a differential pressure of $\geq$ 1438 psid at a flow of $\geq$ 860 gpm. Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow through a test line. This test confirms one point on the pump design curve

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.2 (continued)

and is indicative of overall performance. Instrument uncertainty is not included in the above flow and differential pressure values but is addressed in the surveillance testing procedure. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code (Ref. 2) (only required at 3 month intervals) satisfies this requirement.

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation generated by an auxiliary feedwater actuation signal. The Steam Generator Blowdown, Steam Generator Blowdown Sample, and Unit 2 Feedwater Split Flow Bypass valves close on an auxiliary feedwater actuation to ensure auxiliary feedwater is delivered to the steam generator upper nozzles and is retained in the steam generator for decay heat removal. The AFW flow control valves trip to auto (open) on an auxiliary feedwater actuation to ensure full flow is delivered to each steam generator flow path. The steam admission valves open to supply the turbine driven auxiliary feedwater pump. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a note stating that one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator water level control, if it is capable of being manually realigned to the AFW mode of operation and provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable and applies only when the unit is below 10% RATED THERMAL POWER. Since AFW may be used during startup, shutdown, hot standby operations, and hot shutdown operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY is maintained. The ability to realign the affected AFW train(s)

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.3 (continued)

to a standby condition or to an in-service condition supplying feedwater to the steam generator(s) assures the intended safety function is available. Realignment of the AFW train(s) is normally performed from the Control Room. However, when explicitly allowed by Operations' procedure, this provision may also be applied to local manual operation of AFW valves.

SR 3.7.5.4

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation generated by an auxiliary feedwater actuation signal in MODES 1, 2, and 3. In MODE 4, the required pump is already operating and the autostart function is not required. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by two notes. Note 1 indicates that the SR be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test. Note 2 states that one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator water level control, if it is capable of being manually realigned to the AFW mode of operation and provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable and applies only when the unit is below 10% RATED THERMAL POWER. Since AFW may be used during startup, shutdown, hot standby operations, and hot shutdown operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY is maintained. The ability to realign the affected AFW train(s) to a standby condition or to an in-service condition supplying feedwater to the steam generator(s) assures the intended safety function is available. Realignment of the AFW train(s) is normally performed from the Control Room. However, when explicitly allowed by Operations' procedure, this provision may also be applied to local manual operation of AFW valves.

REFERENCES

1. FSAR, Sections 7.3 and 10.4.9.
2. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

ACTIONS

B.1 and B.2 (continued)

within 6 hours, and in MODE 4, within 12 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 3.7.6.1

This SR verifies that the CST contains the required volume of cooling water. The required CST volume surveillance of 53% level is based on the use of control board indications which include a 3.5% measurement uncertainty. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Sections 3.9B, 7.3, and 9.2.6.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.
4. BTP RSB 5-1, Design Requirements of the Residual Heat Removal System.
5. FSAR Appendix 5A.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1 (continued)

in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.7.2

This SR verifies proper automatic operation of each automatic CCW valve on its associated actual or simulated ESF actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated Safety Injection actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Sections 3.9B, 7.3, and 9.2.2.

2. FSAR, Section 6.2.

BASES

ACTIONS

B.1 (continued)

generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable SSWS train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

C.1 and C.2

If the SSWS train or an SSW Pump on the opposite unit and its associated cross-connects cannot be restored to OPERABLE status within the associated Completion Time, 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 6 hours and in MODE 5 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 3.7.8.1

This SR is modified by a Note indicating that the isolation of the SSWS components or systems may render those components inoperable, but does not affect the OPERABILITY of the SSWS.

Verifying the correct alignment for manual, power operated, and automatic valves in the SSWS flow path provides assurance that the proper flow paths exist for SSWS operation. This SR 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 being locked, sealed, or secured. 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.2

This SR verifies proper position or manual operation of the cross-connect valves between units. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.8.3

This SR verifies proper automatic operation of the SSWS pumps on an actual or simulated Safety Injection actuation signal. The SSWS is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 9.2.1.
2. FSAR, Section 6.2.
3. FSAR, Section 5.4.7.
4. Generic Letter 91-13, "Request for Information related to the Resolution of Generic Issue 130, Essential Service Water System Failures at Multi-unit Sites, Pursuant to 10 CFR 50.54(f)."
5. General Design Criteria 5 and 44.
6. TXX-92410, "License Amendment Request 92-002, Combined Unit 1 and 2 Technical Specifications" dated August 31, 1992.
7. ASME XI.

BASES

ACTIONS (continued)

B.1 and B.2

If the level cannot be restored to OPERABLE status within the associated Completion Time, or if the SSI is inoperable for reasons other than Condition A, 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 6 hours and in MODE 5 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 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the SSWS pumps. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.2

This SR verifies that the SSWS is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Sections 2.3, 2.4 and 9.2.5.
2. Regulatory Guide 1.27.

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

E.1 and E.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CREFS trains inoperable or with one or more CREFS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

F.1

If both CREFS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than an inoperable CRE boundary (i.e., Condition B), the CREFS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, each train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal from humidity in the ambient air. Filtration units with heaters must be operated for $\geq$ 10 continuous hours with the heaters energized. Filtration units without heaters need only be operated for $\geq$ 15 minutes to demonstrate the function of the system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.10.2

This SR verifies that the required CREFS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREFS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency,

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.10.2 (continued)

minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

The VFTP filtration testing requirements of Sections 5.5.11a, b, and c are not required for an Emergency Pressurization Unit when being testing (1) during a periodic test (e.g., 18 months or after 720 hours of operation), (2) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (3) following painting, fire, or chemical release for the corresponding CREFS train to be OPERABLE.

SR 3.7.10.3

This SR verifies that each CREFS train starts and operates on an actual or simulated Safety Injection, Loss-of-Offsite Power, or Intake Vent-High Radiation actuation signal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Each actuation signal must be verified (overlapping testing is acceptable).

SR 3.7.10.4

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 than 5 rem whole body or its equivalent to any part of the body and the CRE occupants are protected from hazardous chemicals and smoke. For Comanche Peak there is no CREFS actuation for hazardous chemical releases or smoke and there are no Surveillance Requirements that verify operability for 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 analyses 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 the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 4) which endorses, with

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

If both CRACS trains are inoperable in MODE 1, 2, 3, or 4, with at least 100% of the required heat removal capability equivalent to a single OPERABLE train available, action must be taken to restore OPERABLE status in 30 days. In this condition, the remaining OPERABLE air conditioning units in both trains are adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CRACS air conditioning units could result in loss of CRACS function. The 30 day Completion Time is based on the low probability of an event challenging the remaining units and the consideration that the remaining train can provide the required protection.

If both CRACS trains are inoperable in MODE 1, 2, 3, or 4, the control room CRACS may not be capable of performing its intended function. Therefore, as an alternative to Required Action E.1, LCO 3.0.3 may be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of the system is sufficient to remove the heat load assumed in the safety analyses in the control room. This SR consists of a combination of testing and calculations. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CRACS heating coils are not required to be included in this SR.

REFERENCES

1. FSAR, Section 6.4.
2. FSAR, Section 9.4.1.

BASES

ACTIONS

C.1 (continued)

The 7 day Completion Time is appropriate because the risk contribution is less than that for the ECCS (72 hour Completion Time), and this system is not a direct support system for the ECCS. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

Concurrent failure of two PPVS trains would result in the loss of functional capability; therefore, LCO 3.0.3 must be entered immediately.

D.1 and D.2

If the PPVS train or negative pressure envelope cannot be restored to OPERABLE status within the associated Completion Time, 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 6 hours, and in MODE 5 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 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Monthly heater operations dry out any moisture that may have accumulated in the charcoal from humidity in the ambient air. Systems with heaters must be operated ≥ 10 continuous hours with the heaters energized with flow through the HEPA filters and charcoal adsorbers. Operation is to be initiated from the Control Room. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.12.2

This SR verifies that the required PPVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The ECCS PREACS filter tests are in accordance with Reference 4. The VFTP includes testing HEPA filter performance, charcoal adsorbers 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 3.7.12.3

This SR verifies that each PPVS train starts and operates on an actual or simulated Safety Injection actuation signal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.12.4

This SR verifies the integrity of the negative pressure envelope. The ability of the Auxiliary and Safeguards buildings to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper functioning of the PPVS. During the post accident mode of operation, the PPVS is designed to maintain a slight negative pressure in the Auxiliary, Fuel and Safeguards buildings, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The acceptance criteria of ≤ -0.05 inches water gauge relative to atmospheric pressure was selected as a reasonable measure of the integrity of the negative pressure boundary. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.12.5

Not used.

SR 3.7.12.6

This SR is required to verify the shutdown of the non-ESF fans to prevent bypass of the ESF Filtration units. The plant design does not include bypass dampers, however, bypass of the filter units will occur if the non-ESF fans are still running when the ESF fans start. Therefore, to prevent bypass, the non-ESF fans must be stopped. The SR demonstrates that the non-ESF fans stop on an actual or simulated ESF actuation signal (safety injection signal). Verification of the tripping of each non-ESF fan on an SI signal is necessary to ensure that the system functions properly. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

assumes that all fuel rods fail, although analysis shows that only the first few rows fail from a hypothetical maximum drop. The fuel storage pool water level satisfies Criteria 2 and 3 of 10CFR50.36(c)(2)(ii).

LCO

The fuel storage area water level is required to be ≥ 23 ft over the top of the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel storage and movement within the spent fuel storage areas.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the spent fuel storage areas, since the potential for a release of fission products exists.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the initial conditions for prevention of an accident cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel storage areas water level is lower than the required level, the movement of irradiated fuel assemblies in the spent fuel storage areas is immediately suspended to a safe position. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage pool must be checked periodically. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

When the concentration of boron in the fuel storage pool is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This action is most efficiently achieved by immediately suspending the movement of fuel assemblies. The concentration of boron is restored simultaneously with suspending movement of fuel assemblies. Prior to resuming movement of fuel assemblies, the concentration of boron must be restored. This requirement does not preclude movement of a fuel assembly to a safe position.

The Required Actions are modified by a Note indicating that LCO 3.0.3 does not apply. If the LCO is not met while moving irradiated fuel assemblies in MODE 5 or 6, LCO 3.0.3 would not be applicable. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, inability to suspend movement of fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies that the concentration of boron in the fuel storage pool is within the required limit. As long as this SR is met, the analyzed accidents are fully addressed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 9.1.

2. License Amendment Requests 94-22, 98-08, and 00-05, Spent Fuel Storage Capacity Increase, Docket NOS 50-445 and 50-446, CPSES.

3. Comanche Peak High Density Spent Fuel Rack Criticality Analysis using Soluble Boron Credit and No Outer Wrapper Plate, dated July, 2001 (Enclosure 2 to TXX-01118).

4. WCAP-14416 NP-A, Rev. 1, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology," November 1996.

5. FSAR, Section 15.7.4.

6. American Nuclear Society, "American National Standard for Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors," ANSI/ANS-8.1-1983, October 7, 1983.

BASES

SURVEILLANCE REQUIREMENTS)

SR 3.7.18.1 (continued)

releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 100.11.
2. FSAR, Chapter 15.

BASES

ACTIONS

A. 1 (continued)

OPERABLE Safety Chilled Water System train could result in loss of the Safety Chilled Water System function. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time.

B.1 and B.2

If the Safety Chilled Water System train cannot be restored to OPERABLE status within the associated Completion Time, 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 6 hours and MODE 5 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 3.7.19.1

This SR is modified by a Note indicating that the isolation of safety chilled water flow to individual components may render these components inoperable but does not affect the OPERABILITY of safety chilled water system.

Verifying the correct alignment for manual valves servicing safety-related equipment provides assurance that the proper flow paths exist for Safety Chilled Water System operation. This SR 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 being locked, sealed, or secured. 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.19.2

This SR verifies proper operation of the Safety Chilled Water System fans and pumps on an actual or simulated Safety Injection actuation signal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.20.1

Verifying each require EFCU operates for ≥ 1 continuous hour ensures that they are OPERABLE. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.20.2

Verifying each UPS A/C train operates for ≥ 1 hour ensures that they are OPERABLE and that all associated controls are functioning properly. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.20.3

This SR verifies that the each UPS A/C train starts and operates on an actual or simulated Safety Injection actuation signal and on an actual or simulated Blackout actuation signal. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 9.4C.8.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SR for demonstrating the OPERABILITY of the DGs are consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), and Regulatory Guide 1.137 (Ref. 10).

Where the SR discussed herein specify voltage and frequency tolerances, the following is applicable.

The minimum steady state output voltage of 6480 V allows for voltage drops to motors and other equipment down to the 120 V level to ensure that the loads will not experience voltage less than the minimum rated voltage. The maximum steady state output voltage of 7150 V ensures that, under lightly loaded conditions, motors and other equipment down to the 120 V level will not experience voltages more than the maximum rated voltage. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.2 and SR 3.8.1.7

These SR help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SR are modified by a Note (Note 2 for SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period. In addition, for SR 3.8.1.2, following prelube, a warmup period is allowed prior to loading.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. For SR 3.8.1.2 and SR 3.8.1.7 testing, the diesel should be started from ambient conditions which means the diesel engine is cold or at a temperature consistent with manufacturer's recommendations.

The DG shall start using one of the following signals: 1) Manual, 2) Simulated or actual safeguards bus undervoltage, 3) Safety Injection simulated or actual signal in conjunction with a simulated or actual loss of offsite power signal, or 4) a Safety Injection simulated or actual signal by itself.

For SR 3.8.1.2, in order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 3.

SR 3.8.1.7 requires that the DG starts from standby conditions, accelerates to 441 RPM, and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR, Chapter 15 (Ref. 5).

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 3) when a modified start procedure as described above is used. If a modified start is not used, the 10 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

In addition to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. 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 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The 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.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by four Notes. Note 1 indicates 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 states that momentary transients, because of changing bus loads, do not invalidate this 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.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the required level. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil for a minimum of 1 hour of DG operation at full load plus 10% (562 gallons) plus 878 gallons which is credited in TS 3.8.3 in meeting the 7 day fuel oil storage requirement.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.5

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. Removal of water from the fuel oil day tanks 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 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 Frequency is controlled under the Surveillance Frequency Control Program. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank. This 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Transfer of each 6.9 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b is a steady state voltage value to which the system must recover following load rejection. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABIITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref.3), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all safety functions encountered from the loss of offsite power, including shedding of the nonessential loads, energization of the emergency buses in ≤ 10 seconds after auto-start signal, and energization of the respective loads from the DG. It further demonstrates the capability of the DG to automatically maintain the required steady state voltage and frequency.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

This SR is modified by two Notes. The reason for Note 1 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. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts, achieves and maintains the required voltage and frequency within the specified time (10 seconds) from the safety injection signal and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for Note 1 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. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start.

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a DG emergency start which occurs from either a loss of voltage or an SI actuation test signal. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.14

Regulatory Guide 1.9 (Ref.3), requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 2 hours of which is at a load equivalent to approximately 110% of the continuous duty rating and the remainder of the time at a load equivalent to 90% to 100% of the continuous duty rating of the DG. For the purposes of the 2 hour run, the minimum load is approximately 110% of the 6300 kW maximum design load in lieu of the 7000 kW continuous rating. The DG start for this Surveillance can be performed either from ambient or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

The 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.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This Surveillance is modified by a Note 1 which states that momentary transients due to changing bus loads do not invalidate this test.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The generator voltage shall be between 6480 V and 7150 V and frequency shall be 60± 1.2 Hz within 10 seconds after the start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.9 (Ref. 3) this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a LOCA actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are consistent with IEEE-308 (Ref. 13).

The intent of the requirement to automatically energize the emergency loads with offsite power is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.17 (continued)

further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.18

Under accident and loss of offsite power conditions loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The 10% load sequence time interval tolerance ensures 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 buses.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.18 (continued)

tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an SI actuation signal. In lieu of actual demonstration of connection and loading of 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. The reason for Note 1 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. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start. The reason for Note 2 is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed (441 rpm) within the specified time when the DGs are started simultaneously.

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 on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions. Standby conditions for a DG mean that the diesel is shutdown but is ready for either a manual or automatic start signal and is ready to pickup the required safety related loads. To minimize degradation resulting from testing, Diesel Generators may have the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations prior to DG start.

SR 3.8.1.21 and SR 3.8.1.22

These SRs ensure the proper functioning of the safety injection and blackout sequencers.

SR 3.8.1.21 applies to the blackout sequencer input undervoltage relays. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.22 applies to the Solid State Safeguards Sequencers (both the Safety Injection Sequencer and the Blackout Sequencer) and is the performance of a TADOT. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

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SURVEILLANCE REQUIREMENTS

SR 3.8.3.1 (continued)

fuel 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.2

The Surveillance contains a note that states that it is required only when the engine has been in shutdown for > 10 hours. This allowance is required because the lube oil level drops when the engine is running and does not immediately return to static conditions.

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG based on an engine lube oil consumption rate of 1.5 gallon per hour. The lube oil inventory equivalent to a 7 day supply is 1.75" below the low static level requirement and is based on conservative DG consumption values. Implicit in this SR is the requirement to verify adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion, and when added to the tank existing volume will maintain the tank volume absolute specific gravity range of $\geq$ 0.8348 and $\leq$ 0.8927 at 60/60°F or an API gravity range of $\geq$ 27° and $\leq$ 38° at 60°F. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. Tests a through d are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests a through d to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.8.3.3 (continued)

can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

Particulate concentrations should be determined in accordance with ASTM D2276-1978, Method A, or D5452-2000 (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. For those designs in which the total stored fuel oil volume is contained in two or more interconnected tanks, each tank must be considered and tested separately.

The Frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals.

SR 3.8.3.4

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. The receiver design requirements provide for a minimum of five engine start cycles without recharging. A start cycle is defined by the DG vendor, but usually is measured in terms of time (seconds of cranking) or engine cranking speed. The pressure specified in this SR is intended to reflect the lowest value at which one start can be accomplished.

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. Removal of water from the fuel storage tanks 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, and 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.

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SURVEILLANCE REQUIREMENTS

SR 3.8.3.5 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 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.

REFERENCES

1. FSAR, Section 9.5.4.1.
2. Regulatory Guide 1.137.
3. ANSI N195-1976.
4. FSAR, Chapter 6.
5. FSAR, Chapter 15.
6. ASTM Standards: D4057-1981; D975-1981; D1298-1980; D4176-1982; D1796-1968; D1552-1979; D2622-1982; D4294-2003; D2276-1978, Method A, D5452-2000.
7. ASTM Standards, D975-1981, Table 1.

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ACTIONS (continued)

D.1 and D.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 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 plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger supplies a continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer. The minimum established float voltage is 2.13 Vpc or 128 V at the battery terminals. This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is recommended 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 duration ensures that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying 300 amps at the minimum established charger test voltage of 130 volts or greater for 8 hours. The ampere requirements are

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.2 (continued)

based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least 2 hours.

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest combined demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ 2 amps.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.4.3

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in FSAR Chapter 8 (Ref. 4).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

Note 2 says to verify the requirement during MODES 3, 4, 5, 6 or with the core off-loaded. This note does not prohibit the application of LCO 3.0.5 or the performance of this SR to restore equipment operability. Note 2 neither approves nor prohibits testing in MODES 1 and 2; however, for testing that is performed in MODES 1 and 2 (e.g., for post work testing) the testing may not be credited to satisfy the SR. Only the testing performed in MODES 3, 4, 5, 6 or with core off-loaded can be credited to satisfy the SR.

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SR 3.8.4.3 (continued)

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ACTIONS

E.1 (continued)

specified for battery parameters on non-redundant batteries not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one train within 2 hours.

F.1

With one or more batteries with any battery parameter, outside the allowances of the Required Actions for Condition A, B, C, D, or E sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding DC battery must be declared inoperable. Additionally, discovering one or more batteries in one train with one or more battery cells float voltage less than 2.07 V and float current greater than 2 amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 4). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained the Required Actions of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of 2 amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained.

SR 3.8.6.2 and SR 3.8.6.5

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 132 V for 60 cells at the battery terminals, or 2.20 Vpc. This provides adequate over-

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SURVEILLANCE REQUIREMENTS

SR 3.8.6.2 and SR 3.8.6.5 (continued)

potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. The minimum float voltage required by the battery manufacturer is 2.13 Vpc which corresponds to 128 V for 60 cells at the battery terminals. Float voltages in the range of less than 2.13 Vpc, but greater than 2.07 Vpc, are addressed in Specification 5.5.19. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of 2.07 V. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.6.3

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.6.4

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., 70°F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.8.6.6

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.

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.6.6; however, only the modified performance discharge test may be used to satisfy the battery service test requirements of SR 3.8.4.3.

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load. This will confirm the battery's ability to meet the critical period of the load duty cycle, in addition to

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.8.6.6 (continued)

determining its percentage of rated capacity. Initial conditions for the modified performance discharge test will be identical to those specified for a service test and the test discharge rate will envelope the duty cycle of the service test if the modified performance discharge test is performed in lieu of a service test.

It may consist of just two rates; for instance 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 of which envelope the duty cycle of the service test. Since the ampere-hours removed by a rated one 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 must 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.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 4) and IEEE-485 (Ref. 5). 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. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

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 18 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. 4), when the battery capacity drops by more than 10% from its capacity of the previous performance test, or is below 90% of the manufacturer's rating. This frequency is consistent with the recommendations in IEEE-450 (Ref. 4).

This SR is modified by a Note. This Note says to verify the requirement during MODES 3, 4, 5, 6 or with the core off-loaded. This note does not prohibit the application of LCO 3.0.5 or the performance of this SR to restore equipment operability. The Note neither approves nor prohibits testing in MODES 1 and 2; however, for testing that is performed in MODES 1 and 2 (e.g., for post work testing) the testing may not be credited to satisfy the SR.

(continued)

BASES (continued)

ACTIONS

A.1

With a required inverter inoperable, its associated AC vital bus becomes inoperable until it is re-energized by an operable inverter or the alternate bypass power supply from the Class 1E transformers.

For this reason a Note has been included in Condition A requiring the entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating." This ensures that the vital bus is re-energized within 2 hours.

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the AC vital bus is powered from its Class 1E transformer, it is relying upon non-regulating interruptible AC electrical power sources (offsite and onsite). Because of the potential impact of interrupted power on the Emergency Diesel Generator and the Solid State Safeguards Blackout Sequencer during a postulated Loss of Offsite Power event, these components are considered inoperable when operating on inverter bypass power, and evaluated under the SFDP of Specification 5.5.15. The uninterruptible inverter source to the AC vital buses is the preferred source for powering instrumentation trip setpoint devices.

B.1 and B.2

If the inoperable devices or components cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 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 plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is available for the instrumentation of the RPS and ESFAS connected to the AC vital buses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

immediately initiate action to restore the required inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is available for the instrumentation connected to the AC vital buses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.

BASES

ACTIONS (continued)

D.1 and D.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 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 plant systems.

E.1

Condition E corresponds to inoperable distribution subsystems that result in a loss of safety function, adequate core cooling, containment OPERABILITY and other vital functions for DBA mitigation would be compromised, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required AC, DC, and AC vital bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.8.10.1 (continued) control functions for critical system loads connected to these buses. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. FSAR, Chapter 6. 2. FSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.9.1.1 (continued) The boron concentration of the coolant in each volume is determined periodically by chemical analysis. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. 10 CFR 50, Appendix A, GDC 26. 2. FSAR, Chapter 15. 3. NRC letter (W. Reckley to N. Carns) dated November 22, 1993: "Wolf Creek Generating Station - Positive Reactivity Addition; Technical Specification Bases Changes"

BASES

SURVEILLANCE REQUIREMENTS	SR 3.9.2.1 (continued) that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked every 72 hours during MODE 6 under SR 3.9.1.1. This Surveillance demonstrates that the valves are closed through a system walkdown (which may include the use of local or remote indicators). The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
REFERENCES	1. FSAR, Section 15. 2. NUREG-0800, Section 15.4.6.

BASES

ACTIONS (continued)

B.1

With no required source range neutron flux monitor OPERABLE, action to restore a monitor to OPERABLE status shall be initiated immediately. Once initiated, action shall be continued until a source range neutron flux monitor is restored to OPERABLE status.

B.2

With no required source range neutron flux monitor OPERABLE, there are no direct means of detecting changes in core reactivity. However, since CORE ALTERATIONS and boron concentration changes inconsistent with Required Action A.2 are not to be made, the core reactivity condition is stabilized until the source range neutron flux monitors are OPERABLE. This stabilized condition is determined by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

The Completion Time of once per 12 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration and ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

SR 3.9.3.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.9.3.2

SR 3.9.3.2 is the performance of a CHANNEL CALIBRATION. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. For the source range neutron detectors, performance data is obtained and evaluated. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. The Surveillance on the open isolation valves will demonstrate that the required valves are not blocked from closing. Also the Surveillance will demonstrate that each valve operator has motive power, which will ensure that each required valve is capable of being closed by an OPERABLE automatic containment ventilation isolation signal.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.9.2

This Surveillance demonstrates that the necessary hardware, tools, and equipment are available to install the equipment hatch. The equipment hatch is provided with a set of hardware, tools, and equipment for moving the hatch from its storage location and installing it in the opening. The required set of hardware, tools, and equipment shall be inspected to ensure that they can perform the required functions.

The Surveillance is performed during CORE ALTERATIONS or movement of irradiated fuel assemblies within the containment. The Surveillance is modified by a Note which only requires that the Surveillance be met for an open equipment hatch. If the equipment hatch is installed in its opening, the availability of the means to install the hatch is not required. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.9.4.3

This Surveillance demonstrates that each required containment ventilation valve actuates to its isolation position on manual initiation or on an actual or simulated high radiation signal from a containment atmosphere gaseous monitoring instrumentation channel. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 15.7.4.
2. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.
3. NUREG-0797, Section 15.4.8, Supplement 22, January 1990.
4. Technical Requirements Manual

BASES

ACTIONS

A.3 (continued)

6 and the refueling water level ≥ 23 ft above the top of the reactor vessel flange, corrective actions shall be initiated immediately.

A.4

If RHR loop requirements are not met, all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere must be closed within 4 hours. With the RHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Closing containment penetrations that are open to the outside atmosphere ensures dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that the RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.4.7.

BASES

ACTIONS

B.3 (continued)

closed within 4 hours. With the RHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Closing containment penetrations that are open to the outside atmosphere ensures that dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

This Surveillance demonstrates that one RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. In addition, during operation of the RHR loop with the water level in the vicinity of the reactor vessel nozzles, the RHR pump suction requirements must be met. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.9.6.2

Verification that the required pump is OPERABLE ensures that an additional RHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 5.4.7.

BASES (continued)

APPLICABILITY

LCO 3.9.7 is applicable when moving irradiated fuel assemblies within containment. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel assemblies are not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.15, "Fuel Storage Pool Water Level."

ACTIONS

A.1

With a water level of < 23 ft above the top of the reactor vessel flange, all operations involving movement of irradiated fuel assemblies within the containment shall be suspended immediately to ensure that a fuel handling accident cannot occur.

The suspension of fuel movement shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the analysis of the postulated fuel handling accident during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a fuel handling accident inside containment (Ref. 2).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Regulatory Guide 1.195, May 2003.
2. FSAR, Section 15.7.4
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.10.
5. Malinowski, D. D., Bell, M. J., Duhn, E., and Locante, J., WCAP-828, Radiological Consequences of a Fuel Handling Accident, December 1971.

(continued)

ATTACHMENT 7 to TXX-11093

PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION

1.0 DESCRIPTION OF AMENDMENT REQUEST

The proposed change requests the adoption of an approved change to the Standard Technical Specifications (STS) for Westinghouse Plants (NUREG-1431), to allow relocation of specific technical specification surveillance frequencies to a licensee-controlled program. The proposed change is described in and consistent with the NRC approved Technical Specification Task Force (TSTF) Traveler 425-A, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - Risk Informed Technical Specifications Task Force (RI-TSTF) Initiative 5b," (ADAMS Accession No. ML090850642) related to the Relocation of Surveillance Frequencies to Licensee Control and was described in the Notice of Availability published in the Federal Register on July 6, 2009 (74 FR 31996). 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 NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," (ADAMS Accession No. 071360456).

2.0 BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION

As required by 10 CFR 50.91(a), the Luminant Power analysis of the issue of no significant hazards consideration is presented below:

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

   Response: No

   The proposed change relocates the specified frequencies for periodic surveillance requirements to licensee control under a new Surveillance Frequency Control Program. 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 change create the possibility of a new or different kind of accident from any previously evaluated?

   Response: No

   No new or different accidents result from utilizing the proposed change. The changes do 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 changes do not impose any new or different requirements. The changes do not alter assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions and current plant operating practice. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No

The design, operation, testing methods, and acceptance criteria for systems, structures, and components (SSCs), 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), since these are not affected by changes to the surveillance frequencies. Similarly, there is no impact to safety analysis acceptance criteria as described in the plant licensing basis. To evaluate a change in the relocated surveillance frequency, Luminant Power will perform a probabilistic risk evaluation using the guidance contained in NRC approved NEI 04-10, Rev. 1 in accordance with the TS SFCP. NEI 04-10, Rev. 1, 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 changes do not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, Luminant Power 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 8 to TXX-11093

TSTF-425 (NUREG-1431) vs. CPNPP TS Cross Reference

TSTF-425 (NUREG-1431) SR Number[1]	TSTF-425 Insert[2]	N/A CPNPP[3]	Corresponding CPNPP TS Surveillance Requirement (SR)[4]	CPNPP TS Insert[5]	TSTF Logic[6]
			3.1.1 Shutdown Margin (SDM) - Reactor Trip Breakers Open		
3.1.1.1	1		3.1.1.1 Verify SDM.	1	
			3.1.2 Core Reactivity		
3.1.2.1	1		3.1.2.1 Verify measured core reactivity.	1	
			3.1.3 Moderator Temperature Coefficient (MTC)		
Not in TSTF	N/A		3.1.3.1 Verify MTC within upper limit.	N/A	
Not in TSTF	N/A		3.1.3.2 Verify MTC within lower limit.	1	X
			3.1.4 Rod Group Alignment Limits		
3.1.4.1	1		3.1.4.1 Verify individual rod positions.	1	
3.1.4.2	1		3.1.4.2 Verify rod freedom of movement.	1	
Not in TSTF	N/A		3.1.4.3 Verify rod drop time.	N/A	
			3.1.5 Shutdown Bank Alignment Limits		
3.1.5.1	1		3.1.5.1 Verify shutdown bank within limits.	1	
			3.1.6 Control Bank Insertion Limits		
Not in TSTF	N/A		3.1.6.1 Verify estimated critical control bank position within limits.	N/A	
3.1.6.2	1		3.1.6.2 Verify control bank position within limits.	1	
3.1.6.3	1		3.1.6.3 Verify control bank sequence and overlap.	1	
			3.1.7 Rod Position Indication		
Not in TSTF	N/A		3.1.7.1 Verify each rod position indicates within 12 steps of bank demand.	N/A	
			3.1.8 PHYSICS TESTS Exceptions – Mode 2		
Not in TSTF	N/A		3.1.8.1 Perform COT.	N/A	
3.1.8.2	1		3.1.8.2 Verify RCS loop temperatures.	1	
3.1.8.3	1		3.1.8.3 Verify THERMAL POWER.	1	

TSTF-425 (NUREG-1431) SR Number[1]	TSTF-425 Insert[2]	N/A CPNPP[3]	Corresponding CPNPP TS Surveillance Requirement (SR)[4]	CPNPP TS Insert[5]	TSTF Logic[6]
3.1.8.4	1		3.1.8.4 Verify SDM.	1	
			3.2.1 FQ(Z) (RAOC-W(Z) Methodology)		
3.2.1.1	1		3.2.1.1 Verify $F^C_Q(Z)$ is within limit.	1	
3.2.1.2	1		3.2.1.2 Verify $F^W_Q(Z)$ is within limit.	1	
			3.2.2. Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)		
3.2.2.1	1		3.2.2.1 Verify $F^N_{\Delta H}$ within limits.	1	
			3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)		
3.2.3.1	1		3.2.3.1 Verify AFD is within limits.	1	
			3.2.4 QUADRANT POWER TILT RATIO (QPTR)		
3.2.4.1	1		3.2.4.1 Verify QPTR by calculation.	1	
3.2.4.2	1		3.2.4.2 Verify QPTR by measurement.	1	
			3.3.1 Reactor Trip System (RTS) Instrumentation		
3.3.1.1	1		3.3.1.1 Perform CHANNEL CHECK.	1	
3.3.1.2	1		3.3.1.2 Calorimetric heat balance calculation.	1	
3.3.1.3	1		3.3.1.3 Core power distribution measurement.	1	
3.3.1.4	1		3.3.1.4 Perform TADOT.	1	
3.3.1.5	1		3.3.1.5 Perform ACTUATION LOGIC TEST.	1	
3.3.1.6	1		3.3.1.6 Calibrate excore channels.	1	
3.3.1.7	1		3.3.1.7 Perform COT.	1	
3.3.1.8	1		3.3.1.8 Perform COT.	1	
3.3.1.9	1		3.3.1.9 Perform TADOT.	1	
3.3.1.10	1		3.3.1.10 Perform CHANNEL CALIBRATION.	1	
3.3.1.11	1		3.3.1.11 Perform CHANNEL CALIBRATION.	1	

TSTF-425 (NUREG-1431) SR Number[1]	TSTF-425 Insert[2]	N/A CPNPP[3]	Corresponding CPNPP TS Surveillance Requirement (SR)[4]	CPNPP TS Insert[5]	TSTF Logic[6]
3.3.1.12	1	X	3.3.1.12 Not used.	N/A	
3.3.1.13	1		3.3.1.13 Perform COT.	1	
3.3.1.14	1		3.3.1.14 Perform TADOT.	1	
Not in TSTF	N/A		3.3.1.15 Perform TADOT.	1	X
3.3.1.16	1		3.3.1.16 Verify RTS RESPONSE TIMES.	1	
			3.3.2 Engineered Safety Features Actuation System (ESFAS) Instrumentation		
3.3.2.1	1		3.3.2.1 Perform CHANNEL CHECK	1	
3.3.2.2	1		3.3.2.2 Perform ACTUATION LOGIC TEST.	1	
3.3.2.3	1	X	3.3.2.3 Not used.	N/A	
3.3.2.4	1		3.3.2.4 Perform MASTER RELAY TEST.	1	
3.3.2.5	1		3.3.2.5 Perform COT.	1	
3.3.2.6	1		3.3.2.6 Perform SLAVE RELAY TEST.	1	
3.3.2.7	1		3.3.2.7 Perform TADOT.	1	
3.3.2.8	1		3.3.2.8 Perform TADOT.	1	
3.3.2.9	1		3.3.2.9 Perform CHANNEL CALIBRATION.	1	
3.3.2.10	1		3.3.2.10 Verify ESF RESPONSE TIMES.	1	
Not in TSTF	N/A		3.3.2.11 Perform TADOT.	1	X
			3.3.3 Post Accident Monitoring (PAM) Instrumentation		
3.3.3.1	1		3.3.3.1 Perform CHANNEL CHECK.	1	
3.3.3.2	1	X	3.3.3.2 Deleted.	N/A	
Not in TSTF	N/A		3.3.3.3 Perform CHANNEL CALIBRATION.	1	X
			3.3.4 Remote Shutdown System		
3.3.4.1	1		3.3.4.1 Perform CHANNEL CHECK.	1	

TSTF-425 (NUREG-1431) SR Number[1]	TSTF-425 Insert[2]	N/A CPNPP[3]	Corresponding CPNPP TS Surveillance Requirement (SR)[4]	CPNPP TS Insert[5]	TSTF Logic[6]
3.3.4.2	1		3.3.4.2 Verify each required HSP power and control circuit and transfer switches.	1	
3.3.4.3	1		3.3.4.3 Perform CHANNEL CALIBRATION.	1	
3.3.4.4	1	X	Perform TADOT of the reactor trip breaker open/closed indication.		
3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation					
3.3.5.1	1	X	Perform CHANNEL CHECK		
Not in TSTF	N/A		3.3.5.1 Perform ACTUATION LOGIC TEST.	1	X
3.3.5.2	1		3.3.5.2 Perform TADOT.	1	
3.3.5.3	1		3.3.5.3 Perform CHANNEL CALIBRATION.	1	
Not in TSTF	N/A		3.3.5.4 Verify LOP DG start ESF RESPONSE TIMES.	1	X
3.3.6 Containment Ventilation Isolation Instrumentation					
3.3.6.1	1		3.3.6.1 Perform CHANNEL CHECK.	1	
3.3.6.2	1		3.3.6.2 Perform ACTUATION LOGIC TEST.	1	
3.3.6.3	1		3.3.6.3 Perform MASTER RELAY TEST.	1	
3.3.6.4	1	X	Perform ACTUATION LOGIC TEST.		
3.3.6.5	1	X	Perform MASTER RELAY TEST.		
3.3.6.6	1		3.3.6.4 Perform COT.	1	
3.3.6.7	1		3.3.6.5 Perform SLAVE RELAY TEST.	1	
3.3.6.8	1	X	Perform TADOT		
Not in TSTF	N/A		3.3.6.6 Not used.	N/A	
3.3.6.9	1		3.3.6.7 Perform CHANNEL CALIBRATION.	1	
3.3.7 Control Room Emergency Filtration System (CREFS) Actuation Instrumentation					
3.3.7.1	1		3.3.7.1 Perform CHANNEL CHECK.	1	
3.3.7.2	1		3.3.7.2 Perform COT.	1	

TSTF-425 (NUREG-1431) SR Number[1]	TSTF-425 Insert[2]	N/A CPNPP[3]	Corresponding CPNPP TS Surveillance Requirement (SR)[4]	CPNPP TS Insert[5]	TSTF Logic[6]
Not in TSTF	N/A		3.3.7.3 Not used.	N/A	
Not in TSTF	N/A		3.3.7.4 Not used.	N/A	
Not in TSTF	N/A		3.3.7.5 Not used.	N/A	
3.3.7.3	1	X	Perform ACTUATION LOGIC TEST.		
3.3.7.4	1	X	Perform MASTER RELAY TEST.		
3.3.7.5	1	X	Perform ACTUATION LOGIC TEST.		
3.3.7.6	1	X	Perform MASTER RELAY TEST.		
3.3.7.7	1	X	Perform SLAVE RELAY TEST.		
3.3.7.8	1		3.3.7.6 Perform TADOT.	1	
3.3.7.9	1		3.3.7.7 Perform CHANNEL CALIBRATION.	1	
		X	**3.3.8 Fuel Building Air Cleanup (FBACS) Actuation Instrumentation**		
		X	**3.3.9 Boron Dilution Protection System (BDPS)**		
			3.4.1. RCS Pressure, Temperature, Flow Departure from Nucleate Boiling (DNB) Limits		
3.3.4.1	1		3.4.1.1 Verify pressurizer pressure within limit.	1	
3.3.4.2	1		3.4.1.2 Verify RCS average temperature within limit.	1	
3.3.4.3	1		3.4.1.3 Verify RCS total flow rate within limit.	1	
3.3.4.4	1		3.4.1.4 Verify RCS total flow rate by precision heat balance within limit.	1	
			3.4.2 RCS Minimum Temperature for Criticality		
3.4.2.1	1		3.4.2.1 Verify RCS Tavg in each operating loop.	1	
			3.4.3 RCS Pressure and Temperature (P/T) Limits		
3.4.3.1	1		3.4.3.1 Verify RCS pressure, temperature, and heatup and cooldown rates within limits.	1	
			3.4.4. RCS Loops – MODE 1 and 2		
3.4.4.1	1		3.4.4.1 Verify each RCS loop is in operation.	1	

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			3.4.5 RCS Loops -- MODE 3		
3.4.5.1	1		3.4.5.1 Verify required RCS loops are in operation.	1	
3.4.5.2	1		3.4.5.2 Verify steam generator secondary side water levels.	1	
3.4.5.3	1		3.4.5.3 Verify breaker alignment/indicated power for required pump not in operation.	1	
			3.4.6 RCS Loops - MODE 4		
3.4.6.1	1		3.4.6.1 Verify one RHR or RCS loop is in operation.	1	
3.4.6.2	1		3.4.6.2 Verify SG secondary side water levels.	1	
3.4.6.3	1		3.4.6.3 Verify breaker alignment/indicated power for required pump not in operation.	1	
			3.4.7 RCS Loops - MODE 5, Loops Filled		
3.4.7.1	1		3.4.7.1 Verify one RHR loop is in operation.	1	
3.4.7.2	1		3.4.7.2 Verify SG secondary side water level	1	
3.4.7.3	1		3.4.7.3 Verify breaker alignment/indicated power for required pump not in operation.	1	
			3.4.8 RCS Loops - MODE 5, Loops Not Filled		
3.4.8.1	1		3.4.8.1 Verify one RHR loop is in operation.	1	
3.4.8.2	1		3.4.8.2 Verify breaker alignment/indicated power for required pump not in operation.	1	
			3.4.9 Pressurizer		
3.4.9.1	1		3.4.9.1 Verify pressurizer water level.	1	
3.4.9.2	1		3.4.9.2 Verify pressurizer heaters capacity.	1	
3.4.9.3	1	X	Verify capability of emergency power for pressurizer heaters.		
			3.4.10 Pressurizer Safety Valves		
Not in TSTF	N/A		3.4.10.1 Verify safety valves OPERABLE.	N/A	
			3.4.11 Pressurizer Power Operated Relief Valves (PORVs)		
3.4.11.1	1		3.4.11.1 Cycle each block valve.	1	

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3.4.11.2	1		3.4.11.2 Cycle each PORV.	1	
3.4.11.3	1	X	Cycle air accumulator valves in PORV control circuits.		
3.4.11.4	1	X	Verify capability of emergency power for pressurizer heaters.		
			3.4.12 Low Temperature Overpressure Protection (LTOP) System		
3.4.12.1	1		3.4.12.1 Verify no safety injection pumps capable of injecting.	1	
3.4.12.2	1		3.4.12.2 Verify maximum of two charging pumps capable of injecting.	1	
3.4.12.3	1		3.4.12.3 Verify accumulators isolated.	1	
3.4.12.4	1		3.4.12.4 Verify RHR suction isolation valves are open.	1	
3.4.12.5	1		3.4.12.5 Verify required RCS vent.	1	
3.4.12.6	1		3.4.12.6 Verify PORV block valve open.	1	
3.4.12.7	1	X	Verify power removed from associated RHR suction isolation valves.		
Not in TSTF	N/A		3.4.12.7 Not used.	N/A	
3.4.12.8	1		3.4.12.8 Perform a COT.	1	
3.4.12.9	1		3.4.12.9 Perform CHANNEL CALIBRATION.	1	
			3.4.13 RCS Operational Leakage		
3.4.13.1	1		3.4.13.1 RCS water inventory balance.	1	
3.4.13.2	1		3.4.13.2 Verify SG LEAKAGE within limit.	1	
			3.4.14 RCS Pressure Isolation Valve (PIV) Leakage		
3.4.14.1	1		3.4.14.1 Verify leakage from PIV.	1	
3.4.14.2	1		3.4.14.2 Verify RHR System interlock prevents valve opening.	1	
3.4.14.3	1	X	Verify RHR System interlock causes valve closure.		
			3.4.15 RCS Leakage Detection System Instrumentation		
3.4.15.1	1		3.4.15.1 Perform CHANNEL CHECK.	1	

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3.4.15.2	1		3.4.15.2 Perform COT.	1	
3.4.15.3	1		3.4.15.3 Perform CHANNEL CALIBRATION.	1	
3.4.15.4	1		3.4.15.4 Perform CHANNEL CALIBRATION.	1	
3.4.15.5	1		3.4.15.5 Perform CHANNEL CALIBRATION.	1	
			3.4.16 RCS Specific Activity		
Not in TSTF	N/A		3.4.16.1 Verify Dose Equivalent Xe-133.	1	X
3.4.16.1	1	X	Verify reactor coolant gross activity < 100/E-bar.		
3.4.16.2	1		3.4.16.2 Verify Dose Equivalent I-131.	1	
Not in TSTF	N/A	X	3.4.16.3 DELETED	N/A	
3.4.16.3	1	X	Determine E-bar by sample.		
			3.4.17 Steam Generator (SG) Tube Integrity		
Not in TSTF	N/A		3.4.17.1 Verify tube integrity.	N/A	
Not in TSTF	N/A		3.4.17.2 Verify tubes plugged.	N/A	
		X	**3.4.17 RCS Loop Isolation Valves**		
		X	**3.4.18 RCS Isolated Loop Startup**		
		X	**3.4.19 RCS Loops - Test Exceptions**		
			3.5.1 Accumulators		
3.5.1.1	1		3.5.1.1 Verify valve open.	1	
3.5.1.2	1		3.5.1.2 Verify borated water volume.	1	
3.5.1.3	1		3.5.1.3 Verify nitrogen cover pressure.	1	
3.5.1.4	1		3.5.1.4 Verify boron concentration.	1	
3.5.1.5	1		3.5.1.5 Verify power removed from valve operator.	1	
			3.5.2 ECCS - Operating		

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3.5.2.1	1		3.5.2.1 Verify valve position.	1	
3.5.2.2	1		3.5.2.2 Verify valve position.	1	
3.5.2.3	1		3.5.2.3 Verify piping full.	N/A	X
Not in TSTF	N/A		3.5.2.4 Verify pump differential pressure.	N/A	
3.5.2.5	1		3.5.2.5 Verify valve actuation.	1	
3.5.2.6	1		3.5.2.6 Verify pump starts.	1	
3.5.2.7	1		3.5.2.7 Verify throttle valve position.	1	
3.5.2.8	1		3.5.2.8 Verify flow path not obstructed.	1	
			3.5.3 ECCS - Shutdown		
Not in TSTF	N/A		3.5.3.1 Surveillance Requirements are applicable.	N/A	
			3.5.4 Refueling Water Storage Tank (RWST)		
3.5.4.1	1		3.5.4.1 Verify water temperature.	1	
3.5.4.2	1		3.5.4.2 Verify borated water volume.	1	
3.5.4.3	1		3.5.4.3 Verify boron concentration.	1	
			3.5.5 Seal Injection Flow		
3.5.5.1	1		3.5.5.1 Verify seal injection throttle valve position.	1	
		X	**3.5.6 Boron Injection Tank (BIT)**		
			3.6.1 Containment		
Not in TSTF	N/A		3.6.1.1 Perform leakage rate testing.	N/A	
Not in TSTF	N/A	X	Verify containment structural integrity.	---	
			3.6.2 Containment Air Locks		
Not in TSTF	N/A		3.6.2.1 Perform leakage rate testing.	N/A	
3.6.2.2	1		3.6.2.2 Verify door operation.	1	

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			3.6.3 Containment Isolation Valves		
3.6.3.1	1		3.6.3.1 Verify valve position.	1	
3.6.3.2	1	X	3.6.3.2 Not used.	N/A	
3.6.3.3	1		3.6.3.3 Verify valve position.	1	
Not in TSTF	N/A		3.6.3.4 Verify valve position.	N/A	
3.6.3.5	1		3.6.3.5 Verify valve isolation time.	N/A	X
3.6.3.6	1	X	3.6.3.6 Not used.	N/A	
3.6.3.7	1		3.6.3.7 Perform leakage rate testing.	1	
3.6.3.8	1		3.6.3.8 Verify valve actuation.	1	
3.6.3.9	1	X	3.6.3.9 Not used.	N/A	
3.6.3.10	1	X	3.6.3.10 Not used.	N/A	
Not in TSTF	N/A	X	3.6.3.11 Not used.	N/A	
		X	3.6.3.12 Not used.	N/A	
		X	3.6.3.13 Not used.	N/A	
			3.6.4 Containment Pressure		
3.6.4.1	1		3.6.4.1 Verify pressure within limits.	1	
			3.6.5 Containment Air Temperature		
3.6.5.1	1		3.6.5.1 Verify temperature within limit.	1	
			3.6.6 Containment Spray System		
3.6.6.1	1		3.6.6.1 Verify valve position.	1	
3.6.6.2	1	X	3.6.6.2 Not used.	N/A	
3.6.6.3	1	X	3.6.6.3 Not used.	N/A	
Not in TSTF	N/A		3.6.6.4 Verify pump differential pressure.	N/A	

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3.6.6.5	1		3.6.6.5 Verify valve actuation.	1	
3.6.6.6	1		3.6.6.6 Verify pump starts.	1	
3.6.6.7	1	X	3.6.6.7 Not used.	N/A	
3.6.6.8	1		3.6.6.8 Verify spray nozzles unobstructed.	N/A	
			3.6.7 Spray Additive System		
Not in TSTF	N/A		3.6.7.1 Verify system ensures sump pH within limit.	N/A	X
3.6.7.1	1	X	Verify valve positions.		
3.6.7.2	1	X	Verify spray additive tank volume.		
3.6.7.3	1	X	Verify spray additive tank concentration.		
3.6.7.4	1	X	Verify valve actuation.		
3.6.7.5	1	X	Verify flowpaths.		
		X	**3.6.8 Shield Building (Dual and Ice Condenser)**		
		X	**3.6.9 Hydrogen Mixing System (HMS) (Atmospheric, Ice Condenser, and Dual)**		
		X	**3.6.10 Hydrogen Ignition System (HIS) (Ice Condenser)**		
		X	**3.6.11 Iodine Cleanup System (ICS) (Atmospheric and Subatmospheric)**		
		X	**3.6.12 Vacuum Relief Valves (Atmospheric and Ice Condenser)**		
		X	**3.6.13 Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser)**		
		X	**3.6.14 Air Return System (ARS) (Ice Condenser)**		
		X	**3.6.15 Ice Bed (Ice Condenser)**		
		X	**3.6.16 Ice Condenser Doors (Ice Condenser)**		
		X	**3.6.17 Divider Barrier Integrity (Ice Condenser)**		
		X	**3.6.18 Containment Recirculation Drains (Ice Condenser)**		

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			3.7.1 Main Steam Safety Valves (MSSVs)		
Not in TSTF	N/A		3.7.1.1 Verify lift setpoint.	N/A	
			3.7.2 Main Steam Isolation Valves (MSIVs)		
Not in TSTF	N/A		3.7.2.1 Verify valve isolation time.	N/A	
3.7.2.2	1		3.7.2.2 Verify valve actuation.	1	
			3.7.3 Feedwater Isolation Valves (FIVs, Feedwater Control Valves (FCVs), and Associated Bypass Valves		
Not in TSTF	N/A		3.7.3.1 Verify valve isolation time.	N/A	
3.7.3.2	1		3.7.3.2 Verify valve actuation.	1	
			3.7.4 Steam Generator Atmospheric Relief Valves (ARVs)		
3.7.4.1	1		3.7.4.1 Cycle valves.	N/A	X
3.7.4.2	1		3.7.4.2 Cycle block valves.	N/A	X
			3.7.5 Auxiliary Feedwater (AFW) System		
3.7.5.1	1		3.7.5.1 Verify valve position.	1	
Not in TSTF	N/A		3.7.5.2 Verify pump differential pressure.	N/A	
3.7.5.3	1		3.7.5.3 Verify valve actuation.	1	
3.7.5.4	1		3.7.5.4 Verify pump starts.	1	
Not in TSTF	N/A	X	Verify flowpaths.	---	
			3.7.6 Condensate Storage Tank (CST)		
3.7.6.1	1		3.7.6.1 Verify level.	1	
			3.7.7 Component Cooling Water (CCW) System		
3.7.7.1	1		3.7.7.1 Verify valve position.	1	
3.7.7.2	1		3.7.7.2 Verify valve actuation.	1	

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3.7.7.3	1		3.7.7.3 Verify pump starts.	1	
			3.7.8 Station Service Water (SSW) System		
3.7.8.1	1		3.7.8.1 Verify valve position.	1	
3.7.8.2	1		3.7.8.2 Cycle cross-connect valves.	1	
3.7.8.3	1		3.7.8.3 Verify pump starts.	1	
			3.7.9 Ultimate Heat Sink (UHS)		
3.7.9.1	1		3.7.9.1 Verify water depth.	1	
3.7.9.2	1		3.7.9.2 Verify intake temperature.	1	
3.7.9.3	1	X	Operate each cooling tower fan	---	
3.7.9.4	1	X	Verify cooling tower fan actuation.	---	
			3.7.10 Control Room Emergency Filtration/Pressurization System (CREFS)		
3.7.10.1	1		3.7.10.1 Operate each train.	1	
Not in TSTF	N/A		3.7.10.2 Perform filter testing.	N/A	X
3.7.10.3	1		3.7.10.3 Verify train actuation.	1	
3.7.10.4	1		3.7.10.4 Perform air inleakage testing.	N/A	X
			3.7.11 Control Room Air Conditioning System (CRACS)		
3.7.11.1	1		3.7.11.1 Verify train capability.	1	
			3.7.12 Primary Plant Ventilation System (PPVS) - ESF Filtration Trains		
3.7.12.1	1		3.7.12.1 Operate each train.	1	
3.7.12.2	1		3.7.12.2 Perform filter testing.	N/A	
3.7.12.3	1		3.7.12.3 Verify train actuation.	1	
Not in TSTF	N/A		3.7.12.4 Verify train capability.	1	
Not in TSTF	N/A		3.7.12.5 Not used.	N/A	

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3.7.12.5	1	X	Verify filter bypass damper closed.	---	
Not in TSTF	N/A		3.7.12.6 Verify non-ESF fan stops on train actuation.	1	X
		X	**3.7.13 Fuel Building Air Cleanup System (FBACS)**		
		X	**3.7.14 Penetration Room Exhaust Air Cleanup System (PREACS)**		
			3.7.15 Fuel Storage Area Water Level		
3.7.15.1	1		3.7.15.1 Verify water level.	1	
			3.7.16 Fuel Storage Pool Boron Concentration		
3.7.16.1	1		3.7.16.1 Verify boron concentration.	1	
			3.7.17 Spent Fuel Assembly Storage		
Not in TSTF	N/A		3.7.17.1 Verify enrichment, burnup, and decay time.	N/A	
			3.7.18 Secondary Specific Activity		
3.7.18.1	1		3.7.18.1 Verify specific activity.	1	
			3.7.19 Safety Chilled Water		
Not in TSTF	N/A		3.7.19.1 Verify valve position.	1	X
Not in TSTF	N/A		3.7.19.2 Verify pump and chiller starts.	1	X
			3.7.20 UPS HVAC System		
Not in TSTF	N/A		3.7.20.1 Verify fan coil unit operation.	1	X
Not in TSTF	N/A		3.7.20.2 Verify train operation.	1	X
Not in TSTF	N/A		3.7.20.3 Verify train actuation.	1	X
			3.8.1 AC Sources - Operating		
3.8.1.1	1		3.8.1.1 Verify breaker alignment.	1	
3.8.1.2	1		3.8.1.2 Verify Diesel Generator (DG) starts from standby conditions.	1	
3.8.1.3	1		3.8.1.3 Verify DG synchronized and loaded.	1	

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3.8.1.4	1		3.8.1.4 Verify day tank level.	1	
3.8.1.5	1		3.8.1.5 Remove accumulated water from day tank.	1	
3.8.1.6	1		3.8.1.6 Verify fuel oil transfer system operation.	1	
3.8.1.7	1		3.8.1.7 Verify DG starts from standby conditions.	1	
3.8.1.8	1		3.8.1.8 Verify transfer of power from normal offsite circuit to alternate offsite circuit.	1	
3.8.1.9	1		3.8.1.9 Verify DG load rejection.	1	
3.8.1.10	1		3.8.1.10 Verify DG maintains load following load reject.	1	
3.8.1.11	1		3.8.1.11 Verify equipment operation on loss of offsite power.	1	
3.8.1.12	1		3.8.1.12 Verify equipment operation on Safety Injection (SI) signal.	1	
3.8.1.13	1		3.8.1.13 Verify automatic trips bypassed on SI signal.	1	
3.8.1.14	1		3.8.1.14 Verify DG operates for □ 24 hours.	1	
3.8.1.15	1		3.8.1.15 Verify DG starts and operates.	1	
3.8.1.16	1		3.8.1.16 Verify DG synchronizes with offsite power.	1	
3.8.1.17	1		3.8.1.17 Verify SI signal overrides test mode.	1	
3.8.1.18	1		3.8.1.18 Verify interval between each sequenced load block.	1	
3.8.1.19	1		3.8.1.19 Verify equipment operation on loss of offsite power in conjunction with SI signal.	1	
3.8.1.20	1		3.8.1.20 Verify simultaneous DG starts and operates.	1	
Not in TSTF	N/A		3.8.1.21 Calibrate BO sequencers.	1	X
Not in TSTF	N/A		3.8.1.22 Perform TADOT for SI and BO sequencers.	1	X
			3.8.2 AC Sources - Shutdown		
Not in TSTF	N/A		3.8.2.1 Surveillance Requirements are applicable.	N/A	
			3.8.3 Diesel Fuel oil, Lube Oil, and Starting Air		
3.8.3.1	1		3.8.3.1 Verify tank level.	1	

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3.8.3.2	1		3.8.3.2 Verify lubricating oil inventory.	1	
Not in TSTF	N/A		3.8.3.3 Verify fuel oil properties.	N/A	
3.8.3.4	1		3.8.3.4 Verify starting air receiver pressure.	1	
3.8.3.5	1		3.8.3.5 Remove accumulated water from storage tank.	1	
			3.8.4 DC Sources - Operating		
3.8.4.1	1		3.8.4.1 Verify battery terminal voltage.	1	
3.8.4.2	1		3.8.4.2 Verify battery chargers supply amperage.	1	
3.8.4.3	1		3.8.4.3 Verify battery capacity (service test).	1	
			3.8.5 DC Sources - Shutdown		
Not in TSTF	N/A		3.8.5.1 Surveillance Requirements are applicable.	N/A	
			3.8.6 Battery Parameters		
3.8.6.1	1		3.8.6.1 Verify battery float current.	1	
3.8.6.2	1		3.8.6.2 Verify battery pilot cell voltage.	1	
3.8.6.3	1		3.8.6.3 Verify battery connected cell electrolyte level.	1	
3.8.6.4	1		3.8.6.4 Verify battery pilot cell temperature.	1	
3.8.6.5	1		3.8.6.5 Verify battery connected cell voltage.	1	
3.8.6.6	1		3.8.6.6 Verify battery capacity (discharge test).	1	
			3.8.7 Inverters - Operating		
3.8.7.1	1		3.8.7.1 Verify inverter voltage and alignment.	1	
			3.8.8 Inverters - Shutdown		
3.8.8.1	1		3.8.8.1 Verify inverter voltage and alignment.	1	
			3.8.9 Distribution Systems - Operating		
3.8.9.1	1		3.8.9.1 Verify breaker alignment and voltage to distribution subsystems.	1	

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			3.8.10 Distribution Systems - Shutdown		
3.8.10.1	1		3.8.10.1 Verify breaker alignment and voltage to distribution subsystems.	1	
			3.9.1 Boron Concentration		
3.9.1.1	1		3.9.1.1 Verify boron concentration.	1	
			3.9.2 Unborated Water Source Isolation Valves		
3.9.2.1	1		3.9.2.1 Verify isolation valves closed.	1	
			3.9.3 Nuclear Instrumentation		
3.9.3.1	1		3.9.3.1 Perform CHANNEL CHECK.	1	
3.9.3.2	1		3.9.3.2 Perform CHANNEL CALIBRATION.	1	
			3.9.4 Containment Penetrations		
3.9.4.1	1		3.9.4.1 Verify containment penetration in required status.	1	
Not in TSTF	N/A		3.9.4.2 Verify capability to install equipment hatch.	1	X
3.9.4.2	1		3.9.4.3 Verify valve actuation.	1	
			3.9.5 Residual Heat Removal (RHR) and Coolant Circulation - High Water Level		
3.9.5.1	1		3.9.5.1 Verify RHR loop circulating reactor coolant.	1	
			3.9.6 Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level		
3.9.6.1	1		3.9.6.1 Verify RHR loop circulating reactor coolant.	1	
3.9.6.2	1		3.9.6.2 Verify breaker alignment/indicated power for required pump not in operation.	1	
			3.9.7 Refueling Cavity Water Level		
3.9.7.1	1		3.9.7.1 Verify water level	1	

Notes:

1. TSTF 425 SR Number - A list of the surveillance requirements from NUREG-1431 provided in the TSTF for change.

2. TSTF-425 Insert - "1" is provided in this column where standard insert wording is being used for the surveillance requirement being relocated, "---" is provided where the surveillance requirement does not exist, and "N/A" is provided where no change is proposed because the surveillance requirement is event driven, conditional, or controlled by another approved program and therefore not a candidate for relocation.

3. N/A CPNPP - An "X" in this column means CPNPP does not have the surveillance requirement referenced in the TSTF.

4. Similar Corresponding CPNPP TS Surveillance Requirements (SR) - A list of the similar surveillance requirements that are included in the CPNPP Technical Specifications.

5. CPNPP TS Insert - "1" is provided in this column where standard insert wording is being used for the surveillance requirement being relocated, "---" is provided where the surveillance requirement does not exist, and "N/A" is provided where no change is proposed because the surveillance requirement is event driven, conditional, or controlled by another approved program and therefore not a candidate for relocation.

6. TSTF Logic - An "X" in this column identifies where logic from the TSTF was used to justify changes to CPNPP surveillance requirements.