August 31, 2004 TSTF-04-08

Thomas H. Boyce, Section Chief
Technical Specifications Section
Reactor Operations Branch
Division of Inspection Program Management
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: TSTF-425, Revision 0, "Relocate Surveillance Frequencies to Licensee Control"

Dear Mr. Boyce:

Enclosed for NRC review is Revision 0 of TSTF-425, "Relocate Surveillance Frequencies to Licensee Control."

This Traveler supports NEI Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b, "Relocate Surveillance Test Intervals to Licensee Control" for Boiling Water Reactors. The supporting methodology document, NEI 04-10, "Risk-Informed Technical Specification Task Force (RITSTF) Initiative 5B - Relocation of Surveillance Frequencies," is referenced in TSTF-425 and will be submitted separately by NEI.

Limerick Generating Station submitted the lead plant submittal for this RITSTF Initiative on June 11, 2004.

We request that NRC review of the Traveler be granted a fee waiver pursuant to the provisions of 10 CFR 170.11. Specifically, the request is to support NRC generic regulatory improvements (risk management technical specifications), in accordance with 10 CFR 170.11(a)(1)(iii). This request is consistent with the NRC letter to A. R. Pietrangelo on this subject dated January 10, 2003.

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Should you have any questions, please do not hesitate to contact us.

Dennis Buschbaum (WOG)

Bert Morris (BWROG)

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Enclosure

cc: A.R. Pietrangelo, NEI

# Technical Specification Task Force
# Improved Standard Technical Specifications Change Traveler

**Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5**

NUREGs Affected: ☐ 1430 ☐ 1431 ☐ 1432 ☑ 1433 ☑ 1434

Classification: 1) Technical Change Recommended for CLIIP?: Yes

Correction or Improvement: Improvement

Industry Contact: Bert Morris, (256) 729-7909, bcmorris3@tva.gov

## 1.0 Description

The proposed change relocates all periodic Surveillance Frequencies to licensee control. Revisions to the Surveillance Frequencies will be made in accordance with a new program, the Surveillance Frequency Control Program, which is added to the Administrative Controls.

## 2.0 Proposed Change

The proposed change relocates all periodic Surveillance Frequencies from the Technical Specifications and places the Frequencies under licensee control in accordance with a new program, the Surveillance Frequency Control Program. All Surveillance Frequencies are relocated except:

- Frequencies that reference other programs for the specific interval (such as the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program),
- Frequencies that are event driven (such as "Each time the control rod is withdrawn to the 'full out' position" or "Once within 12 hours after $\geq$ 25% RTP").

A new Administrative Controls Program is added as Specification 5.5.15. The program is called the Surveillance Frequency Control Program and describes the requirements for a program to control future changes to relocated Surveillance Frequencies.

The Bases for each Surveillance are revised to state that the Frequency is set in accordance with the Surveillance Frequency Control Program.



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## 3.0 Background

The NRC has been reviewing and granting improvements to the Improved Standard Technical Specifications (ISTS) based, at least in part, on probabilistic risk analysis insights. Typically, the proposed improvements involved a relaxation of one or more Completion Times or Surveillance Frequencies the TS.

In August 1995, the NRC adopted a final policy statement on the use of probabilistic risk assessment (PRA) methods, which included the following regarding the expanded use of PRA (Ref. 1).

- The use of PRA technology should be increased in all regulatory matters to the extent supported by the state of the art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy.

- PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state of the art, to reduce unnecessary conservatism associated with current regulatory requirements, regulatory guides, license commitments, and staff practices. Where appropriate, PRA should be used to support the proposal of additional regulatory requirements in accordance with 10 CFR 50.109 (Backfit Rule). Appropriate procedures for including PRA in the process for changing regulatory requirements should be developed and followed. It is, of course, understood that the intent of this policy is that existing rules and regulations shall be complied with unless these rules and regulations are revised.

- PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.

- The Commission's safety goals for nuclear power plants and subsidiary numerical objectives are to be used with appropriate consideration of uncertainties in making regulatory judgments on need for proposing and backfitting new generic requirements on nuclear power plant licensees.

In its approval of the policy statement, the Commission articulated its expectation that implementation of the policy statement will improve the regulatory process in three areas: foremost, through safety decisionmaking enhanced by the use of PRA insights; through more efficient use of agency resources; and through a reduction in unnecessary burdens on licensees.

This Traveler is being submitted by the industry Technical Specification Task Force (TSTF) in cooperation with the Nuclear Energy Institute (NEI) Risk Informed Technical Specification Task Force (RITSTF) to implement RITSTF Initiative 5b, "Relocate Surveillance Test Intervals to Licensee Control."



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## 4.0 Technical Analysis

The control of changes to the relocated Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. That 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. In addition,

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-XX, "Title."

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.

The referenced document, NEI 04-XX, "Title," provides a detailed description of the process to be followed when considering changes to a Surveillance Frequency. That document is attached. Therefore, the process is not discussed further here.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 (Ref. 2) and 1.177 (Ref. 3). Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF). Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies.

Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

1. **The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.**

   10 CFR 50.36(c) (Ref. 10) provides that TS will include items in the following categories:

   "(3) *Surveillance requirements*. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

   This change proposes to relocate various Frequencies for the performance of the Surveillance Requirements to a licensee-controlled program using an NRC approved methodology for control of the Surveillance Frequencies. The Surveillance Requirements themselves will remain in TS. This is consistent with other NRC approved TS changes in which the Surveillance Frequencies are not under NRC control, such as Surveillances that are performed in accordance with the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program, where the Frequencies vary based on the past performance of the subject components. Thus, this proposed change meets criterion 1 above.

2. **The proposed change is consistent with the defense-in-depth philosophy.**

   As described in Position 2.2.1.1 of Regulatory Guide 1.174, consistency with the defense-in-depth philosophy is maintained if:



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- A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation.
- Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided.
- System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers).
- Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed.
- Independence of barriers is not degraded.
- Defenses against human errors are preserved.
- The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

These defense-in-depth objectives apply to all risk-informed applications, and for some of the issues involved (e.g., no over-reliance on programmatic activities and defense against human errors), it is fairly straightforward to apply them to this proposed change. The use of the multiple risk metrics of CDF and LERF and controlling their change resulting from the implementation of this initiative would maintain a balance between prevention of core damage, prevention of containment failure, and consequence mitigation. Redundancy, diversity, and independence of safety systems are considered as part of the risk categorization to ensure that these qualities are not adversely affected. Independence of barriers and defense against common cause failures are also considered in the categorization. The improved understanding of the relative importance of plant components to risk resulting from the development of this program promotes an improved overall understanding of how the SSCs contribute to the plant's defense-in-depth.

**3. The proposed change maintains sufficient safety margins.**

Conformance with this principle is assured since Codes and Standards or alternatives approved for use by the NRC will still be met with the proposed change. Also, the safety analysis acceptance criteria in the licensing basis (e.g., Final Safety Analysis Report, supporting analyses, etc.) are met with the proposed change.

**4. When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.**

NEI 04-XX, "Title," will require that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

**5. The impact of the proposed change should be monitored using performance measurement strategies.**

NEI 04-XX, "Title," will require that changes in Surveillance Frequencies be monitored using performance management strategies.

Therefore, the proposed change is consistent with the guidance in Regulatory Guide 1.174.



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## 5.0 Regulatory Analysis

### 5.1 No Significant Hazards Consideration

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

   Response: No.

   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 mitigative 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 accident 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 change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No.

   The proposed change is administrative in nature, does not negate any existing requirement, and does not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. As such, there are no changes being made to safety analysis assumptions, safety limits or safety system settings that would adversely affect plant safety as a result of the proposed change. Margins of safety are unaffected by relocation of the surveillance test intervals to a licensee-controlled program.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.



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Based on the above, the TSTF concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.



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## 5.2 Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act of 1954, as amended (the Act) requires applicants for nuclear power plant operating licenses to include the TS as part of the license. The Commission's regulatory requirements related to the content for the TS are set forth in 10 CFR 50.36. That regulation requires that the TS include items in eight specific categories. The categories are: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; (5) administrative controls; (6) decommissioning; (7) initial notification; and (8) written reports. However, the regulation does not specify the particular requirements to be included in a plant's TS.

The proposed change is consistent with other Surveillance Frequencies in the ISTS. In several instances, the ISTS do not specify a particular surveillance Frequency but rather state the Frequency as "In accordance with the Inservice Testing Program." The Inservice Testing Program references Section XI of the ASME Boiler and Pressure Vessel Code for the surveillance intervals. The surveillance intervals are based on the plant's Inservice Testing (IST) Program which implements the ASME Code. Within the IST program, the actual surveillance intervals vary based on the performance of the individual components. In other instances, the TS again do not specify a particular surveillance Frequency but instead require that the surveillance be performed "in accordance with the Primary Containment Leakage Rate Testing Program." The Primary Containment Leakage Rate Testing Program references 10 CFR 50, Appendix J, Option B, which allows performance based testing. The surveillance Frequency varies based on the past performance of the subject components.

The proposed TS changes are administrative in nature. Relocation of the Surveillance Frequencies from the TS to a licensee-controlled program does not affect the plant design, hardware, or system operation and will not affect the ability of the plant to perform its design function in mitigating the consequences of a postulated design basis accident. Therefore, the proposed change does not adversely affect nuclear safety or plant operations.

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 approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

## 6.0 Environmental Consideration

A review has determined that the proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change 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 change.

## 7.0 References

1. USNRC, "Use of Probabilistic Risk Assessment Methods in Nuclear Activities: Final Policy Statement," *Federal Register*, Vol. 60, p. 42622, August 16, 1995.

2. Regulatory Guide 1.174, "An Approach for using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis," July 1998



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3. Regulatory Guide 1.177, "An Approach for Plant-Specific Risk-Informed Decisionmaking: Technical Specification," August 1998

## Revision History

### OG Revision 0 Revision Status: Active

Revision Proposed by: BWROG

Revision Description:
Original Issue

### Owners Group Review Information

Date Originated by OG: 21-May-04

Owners Group Comments
(No Comments)

Owners Group Resolution: Date:

## Affected Technical Specifications

| | |
|---|---|
| SR 3.1.1.1 | RPS Instrumentation |
| SR 3.1.1.1 | RPS Instrumentation |
| SR 3.1.1.1 Bases | RPS Instrumentation |
| SR 3.1.1.2 | RPS Instrumentation |
| SR 3.1.1.2 Bases | RPS Instrumentation |
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| SR 3.3.5.2.5 Bases | RCIC Instrumentation |
| SR 3.3.6.1.1 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.1 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.2 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.2 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.3 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.3 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.4 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.4 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.5 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.5 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.6 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.6 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.7 | Primary Containment Isolation Instrumentation |
| SR 3.3.6.1.7 Bases | Primary Containment Isolation Instrumentation |
| SR 3.3.6.2.1 | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.1 Bases | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.2 | Secondary Containment Isolation Instrumentation |



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| SR 3.3.6.2.2 Bases | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.3 | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.3 Bases | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.4 | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.4 Bases | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.5 | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.5 Bases | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.6 | Secondary Containment Isolation Instrumentation |
| SR 3.3.6.2.6 Bases | Secondary Containment Isolation Instrumentation |
| SR 3.3.8.1.1 | LOP Instrumentation |
| SR 3.3.8.1.1 Bases | LOP Instrumentation |
| SR 3.3.8.1.2 | LOP Instrumentation |
| SR 3.3.8.1.2 Bases | LOP Instrumentation |
| SR 3.3.8.1.3 | LOP Instrumentation |
| SR 3.3.8.1.3 Bases | LOP Instrumentation |
| SR 3.3.8.1.4 | LOP Instrumentation |
| SR 3.3.8.1.4 Bases | LOP Instrumentation |
| SR 3.3.8.2.1 | RPS Electric Power Monitoring |
| SR 3.3.8.2.1 Bases | RPS Electric Power Monitoring |
| SR 3.3.8.2.2 | RPS Electric Power Monitoring |
| SR 3.3.8.2.2 Bases | RPS Electric Power Monitoring |
| SR 3.3.8.2.3 | RPS Electric Power Monitoring |
| SR 3.3.8.2.3 Bases | RPS Electric Power Monitoring |
| SR 3.4.1.1 | Recirculation Loops Operating |
| SR 3.4.1.1 Bases | Recirculation Loops Operating |
| SR 3.5.1.1 | ECCS - Operating |
| SR 3.5.1.1 Bases | ECCS - Operating |



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| SR 3.5.1.2 | ECCS - Operating |
| SR 3.5.1.2 Bases | ECCS - Operating |
| SR 3.5.1.3 | ECCS - Operating |
| SR 3.5.1.3 Bases | ECCS - Operating |
| SR 3.5.1.4 | ECCS - Operating |
| SR 3.5.1.4 Bases | ECCS - Operating |
| SR 3.5.1.5 | ECCS - Operating |
| SR 3.5.1.5 Bases | ECCS - Operating |
| SR 3.5.1.7 | ECCS - Operating |
| SR 3.5.1.7 Bases | ECCS - Operating |
| SR 3.5.2.1 | ECCS - Shutdown |
| SR 3.5.2.1 Bases | ECCS - Shutdown |
| SR 3.5.2.2 | ECCS - Shutdown |
| SR 3.5.2.2 Bases | ECCS - Shutdown |
| SR 3.5.2.3 | ECCS - Shutdown |
| SR 3.5.2.3 Bases | ECCS - Shutdown |
| SR 3.5.2.4 | ECCS - Shutdown |
| SR 3.5.2.4 Bases | ECCS - Shutdown |
| SR 3.5.2.5 | ECCS - Shutdown |
| SR 3.5.2.5 Bases | ECCS - Shutdown |
| SR 3.5.2.6 | ECCS - Shutdown |
| SR 3.5.2.6 Bases | ECCS - Shutdown |
| SR 3.5.3.1 | RCIC System |
| SR 3.5.3.1 Bases | RCIC System |
| SR 3.5.3.2 | RCIC System |
| SR 3.5.3.2 Bases | RCIC System |
| SR 3.5.3.3 | RCIC System |



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| SR 3.5.3.3 Bases | RCIC System |
| SR 3.5.3.4 | RCIC System |
| SR 3.5.3.4 Bases | RCIC System |
| SR 3.5.3.5 | RCIC System |
| SR 3.5.3.5 Bases | RCIC System |
| SR 3.6.1.2.2 | Primary Containment Air Locks |
| SR 3.6.1.2.2 Bases | Primary Containment Air Locks |
| SR 3.6.1.3.1 | PCIVs |
| SR 3.6.1.3.2 | PCIVs |
| SR 3.6.1.3.3 | PCIVs |
| SR 3.6.1.3.5 | PCIVs |
| SR 3.6.1.3.6 | PCIVs |
| SR 3.6.1.3.7 | PCIVs |
| SR 3.6.1.3.8 | PCIVs |
| SR 3.6.1.3.10 | PCIVs |
| SR 3.6.1.6.1 | LLS Valves |
| SR 3.6.1.6.1 Bases | LLS Valves |
| SR 3.6.1.6.2 | LLS Valves |
| SR 3.6.1.6.2 Bases | LLS Valves |
| SR 3.6.1.9.1 | MSIV LCS |
| SR 3.6.1.9.1 Bases | MSIV LCS |
| SR 3.6.1.9.2 | MSIV LCS |
| SR 3.6.1.9.2 Bases | MSIV LCS |
| SR 3.6.1.9.3 | MSIV LCS |
| SR 3.6.1.9.3 Bases | MSIV LCS |
| SR 3.6.2.1.1 | Supression Pool Average Temperature |
| SR 3.6.2.1.1 Bases | Supression Pool Average Temperature |



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| SR 3.6.2.2.1 | Supression Pool Water Level |
| SR 3.6.2.2.1 Bases | Supression Pool Water Level |
| SR 3.6.3.2.1 | RHR Suppression Pool Cooling |
| SR 3.6.3.2.1 Bases | RHR Suppression Pool Cooling |
| SR 3.6.3.2.2 | RHR Suppression Pool Cooling |
| SR 3.6.3.2.2 Bases | RHR Suppression Pool Cooling |
| SR 3.6.4.1.1 | Secondary Containment |
| SR 3.6.4.1.1 Bases | Secondary Containment |
| SR 3.6.4.1.2 | Secondary Containment |
| SR 3.6.4.1.2 Bases | Secondary Containment |
| SR 3.6.4.1.3 | Secondary Containment |
| SR 3.6.4.1.3 Bases | Secondary Containment |
| SR 3.6.4.1.4 | Secondary Containment |
| SR 3.6.4.1.4 Bases | Secondary Containment |
| SR 3.6.4.1.5 | Secondary Containment |
| SR 3.6.4.1.5 Bases | Secondary Containment |
| SR 3.6.4.2.1 | SCIVs |
| SR 3.6.4.2.1 Bases | SCIVs |
| SR 3.6.4.2.2 | SCIVs |
| SR 3.6.4.2.2 | SCIVs |
| SR 3.6.4.2.3 | SCIVs |
| SR 3.6.4.2.3 Bases | SCIVs |
| SR 3.6.4.3.1 | SGT System |
| SR 3.6.4.3.1 Bases | SGT System |
| SR 3.6.4.3.3 | SGT System |
| SR 3.6.4.3.3 Bases | SGT System |
| SR 3.6.4.3.4 | SGT System |



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| SR 3.6.4.3.4 Bases | SGT System |
| SR 3.8.1.1 | AC Sources - Operating |
| SR 3.8.1.1 Bases | AC Sources - Operating |
| SR 3.8.1.2 | AC Sources - Operating |
| SR 3.8.1.2 Bases | AC Sources - Operating |
| SR 3.8.1.3 | AC Sources - Operating |
| SR 3.8.1.3 Bases | AC Sources - Operating |
| SR 3.8.1.4 | AC Sources - Operating |
| SR 3.8.1.4 Bases | AC Sources - Operating |
| SR 3.8.1.5 | AC Sources - Operating |
| SR 3.8.1.5 Bases | AC Sources - Operating |
| SR 3.8.1.6 | AC Sources - Operating |
| SR 3.8.1.6 Bases | AC Sources - Operating |
| SR 3.8.1.7 | AC Sources - Operating |
| SR 3.8.1.7 Bases | AC Sources - Operating |
| SR 3.8.1.8 | AC Sources - Operating |
| SR 3.8.1.8 Bases | AC Sources - Operating |
| SR 3.8.1.9 | AC Sources - Operating |
| SR 3.8.1.9 Bases | AC Sources - Operating |
| SR 3.8.1.10 | AC Sources - Operating |
| SR 3.8.1.10 Bases | AC Sources - Operating |
| SR 3.8.1.11 | AC Sources - Operating |
| SR 3.8.1.11 Bases | AC Sources - Operating |
| SR 3.8.1.12 | AC Sources - Operating |
| SR 3.8.1.12 Bases | AC Sources - Operating |
| SR 3.8.1.13 | AC Sources - Operating |
| SR 3.8.1.13 Bases | AC Sources - Operating |



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| SR 3.8.1.14 | AC Sources - Operating |
| SR 3.8.1.14 Bases | AC Sources - Operating |
| SR 3.8.1.15 | AC Sources - Operating |
| SR 3.8.1.15 Bases | AC Sources - Operating |
| SR 3.8.1.16 | AC Sources - Operating |
| SR 3.8.1.16 Bases | AC Sources - Operating |
| SR 3.8.1.17 | AC Sources - Operating |
| SR 3.8.1.17 Bases | AC Sources - Operating |
| SR 3.8.1.18 | AC Sources - Operating |
| SR 3.8.1.18 Bases | AC Sources - Operating |
| SR 3.8.1.19 | AC Sources - Operating |
| SR 3.8.1.19 Bases | AC Sources - Operating |
| SR 3.8.1.20 | AC Sources - Operating |
| SR 3.8.1.20 Bases | AC Sources - Operating |
| SR 3.8.2.1 | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.1 Bases | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.2 | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.2 Bases | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.4 | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.4 Bases | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.5 | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.2.5 Bases | Diesel Fuel Oil, Lube Oil, and Starting Air |
| SR 3.8.4.1 | DC Sources - Operating |
| SR 3.8.4.1 Bases | DC Sources - Operating |
| SR 3.8.4.2 | DC Sources - Operating |
| SR 3.8.4.2 Bases | DC Sources - Operating |
| SR 3.8.4.3 | DC Sources - Operating |



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| SR 3.8.4.3 Bases | DC Sources - Operating |
| SR 3.8.6.1 | Battery Parameters |
| SR 3.8.6.1 Bases | Battery Parameters |
| SR 3.8.6.2 | Battery Parameters |
| SR 3.8.6.2 Bases | Battery Parameters |
| SR 3.8.6.3 | Battery Parameters |
| SR 3.8.6.3 Bases | Battery Parameters |
| SR 3.8.6.4 | Battery Parameters |
| SR 3.8.6.4 Bases | Battery Parameters |
| SR 3.8.6.5 | Battery Parameters |
| SR 3.8.6.5 Bases | Battery Parameters |
| SR 3.8.6.6 | Battery Parameters |
| SR 3.8.6.6 Bases | Battery Parameters |
| SR 3.8.7.1 | Inverters - Operating |
| SR 3.8.7.1 Bases | Inverters - Operating |
| SR 3.8.8.1 | Inverters - Shutdown |
| SR 3.8.8.1 Bases | Inverters - Shutdown |
| SR 3.8.9.1 | Distribution Systems - Operating |
| SR 3.8.9.1 Bases | Distribution Systems - Operating |
| SR 3.8.10.1 | Distribution Systems - Shutdown |
| SR 3.8.10.1 Bases | Distribution Systems - Shutdown |
| SR 3.9.1.1 | Refueling Equipment Interlocks |
| SR 3.9.1.1 Bases | Refueling Equipment Interlocks |
| SR 3.9.2.1 | Refueling Position One-Rod-Out Interlock |
| SR 3.9.2.1 Bases | Refueling Position One-Rod-Out Interlock |
| SR 3.9.2.2 | Refueling Position One-Rod-Out Interlock |
| SR 3.9.2.2 Bases | Refueling Position One-Rod-Out Interlock |



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| SR 3.9.3.1 | Control Rod Position |
| SR 3.9.3.1 Bases | Control Rod Position |
| SR 3.9.5.1 | Control Rod OPERABILITY - Refueling |
| SR 3.9.5.1 Bases | Control Rod OPERABILITY - Refueling |
| SR 3.9.5.2 | Control Rod OPERABILITY - Refueling |
| SR 3.9.5.2 Bases | Control Rod OPERABILITY - Refueling |
| SR 3.9.6.1 | [RPV] Water Level - [Irradiated Fuel] |
| SR 3.9.6.1 Bases | [RPV] Water Level - [Irradiated Fuel] |
| SR 3.9.7.1 | [RPV] Water Level - [New Fuel or Control Rods] |
| SR 3.9.7.1 Bases | [RPV] Water Level - [New Fuel or Control Rods] |
| SR 3.9.8.1 | RHR - High Water Level |
| SR 3.9.8.1 Bases | RHR - High Water Level |
| SR 3.9.9.1 | RHR - Low Water Level |
| SR 3.9.9.1 Bases | RHR - Low Water Level |
| SR 3.10.2.1 | Reactor Mode Switch Interlock Testing |
| SR 3.10.2.1 Bases | Reactor Mode Switch Interlock Testing |
| SR 3.10.2.2 | Reactor Mode Switch Interlock Testing |
| SR 3.10.2.2 Bases | Reactor Mode Switch Interlock Testing |
| SR 3.10.3.2 | Single Control Rod Withdrawal - Hot Shutdown |
| SR 3.10.3.2 Bases | Single Control Rod Withdrawal - Hot Shutdown |
| SR 3.10.3.3 | Single Control Rod Withdrawal - Hot Shutdown |
| SR 3.10.3.3 Bases | Single Control Rod Withdrawal - Hot Shutdown |
| SR 3.10.4.2 | Single Cotnrol Rod Withdrawal - Cold Shutdown |
| SR 3.10.4.2 Bases | Single Cotnrol Rod Withdrawal - Cold Shutdown |
| SR 3.10.4.3 | Single Cotnrol Rod Withdrawal - Cold Shutdown |
| SR 3.10.4.3 Bases | Single Cotnrol Rod Withdrawal - Cold Shutdown |
| SR 3.10.4.4 | Single Cotnrol Rod Withdrawal - Cold Shutdown |



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| SR 3.10.4.4 Bases | Single Cotnrol Rod Withdrawal - Cold Shutdown |
| SR 3.10.5.1 | Single CRD Removal - Refueling |
| SR 3.10.5.1 Bases | Single CRD Removal - Refueling |
| SR 3.10.5.2 | Single CRD Removal - Refueling |
| SR 3.10.5.2 Bases | Single CRD Removal - Refueling |
| SR 3.10.5.3 | Single CRD Removal - Refueling |
| SR 3.10.5.3 Bases | Single CRD Removal - Refueling |
| SR 3.10.5.5 | Single CRD Removal - Refueling |
| SR 3.10.5.5 Bases | Single CRD Removal - Refueling |
| SR 3.10.6.1 | Multiple Control Rod Withdrawal - Refueling |
| SR 3.10.6.1 Bases | Multiple Control Rod Withdrawal - Refueling |
| SR 3.10.6.2 | Multiple Control Rod Withdrawal - Refueling |
| SR 3.10.6.2 Bases | Multiple Control Rod Withdrawal - Refueling |
| SR 3.10.6.3 | Multiple Control Rod Withdrawal - Refueling |
| SR 3.10.6.3 Bases | Multiple Control Rod Withdrawal - Refueling |
| SR 3.10.8.4 | SDM Test - Refueling |
| SR 3.10.8.4 Bases | SDM Test - Refueling |
| SR 3.10.8.6 | SDM Test - Refueling |
| SR 3.10.8.6 Bases | SDM Test - Refueling |
| SR 3.10.9.1 | Recirculation Loops - Testing |
| SR 3.10.9.1 Bases | Recirculation Loops - Testing |
| SR 3.10.9.2 | Recirculation Loops - Testing |
| SR 3.10.9.2 Bases | Recirculation Loops - Testing |
| SR 3.10.10.1 | Training Startups |
| SR 3.10.10.1 Bases | Training Startups |
| SR 3.10.10.2 | Training Startups |
| SR 3.10.10.2 Bases | Training Startups |



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| 5.5.15 | Surveillance Frequency Control Program<br>Change Description: New Program | |
| SR 3.3.2.2.1 | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.1 Bases | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.2 | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.2 Bases | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.3 | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.3 Bases | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.4 | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.2.2.4 Bases | Feedwater and Main Turbine High Water Level Trip Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.5.2.6 | RCIC Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.5.2.6 Bases | RCIC Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.1.8 | Primary Containment Isolation Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.1.8 Bases | Primary Containment Isolation Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.2.7 | Secondary Containment Isolation Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.2.7 Bases | Secondary Containment Isolation Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.1 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.1 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.2 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.2 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.3 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.3 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.4 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.4 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |



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| SR 3.3.6.3.5 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.5 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.6 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.6 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.7 | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.6.3.7 Bases | LLS Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.1 | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.1 Bases | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.2 | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.2 Bases | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.3 | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.3 Bases | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.4 | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.4 Bases | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.5 | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.3.7.1.5 Bases | [MCREC} System Instrumentation | NUREG(s)- 1433 Only |
| SR 3.4.2.1 | Jet Pumps | NUREG(s)- 1433 Only |
| SR 3.4.2.1 Bases | Jet Pumps | NUREG(s)- 1433 Only |
| SR 3.4.3.1 | S/RVs | NUREG(s)- 1433 Only |
| SR 3.4.3.1 Bases | S/RVs | NUREG(s)- 1433 Only |
| SR 3.4.3.2 | S/RVs | NUREG(s)- 1433 Only |
| SR 3.4.3.2 Bases | S/RVs | NUREG(s)- 1433 Only |
| SR 3.4.4.1 | RCS Operational Leakage | NUREG(s)- 1433 Only |
| SR 3.4.4.1 Bases | RCS Operational Leakage | NUREG(s)- 1433 Only |
| SR 3.4.5.1 | RCS PIV Leakage | NUREG(s)- 1433 Only |
| SR 3.4.5.1 Bases | RCS PIV Leakage | NUREG(s)- 1433 Only |
| SR 3.4.6.1 | RCS Leakae Detection Instrumentation | NUREG(s)- 1433 Only |



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| SR 3.4.6.1 Bases | RCS Leakae Detection Instrumentation | NUREG(s)- 1433 Only |
| SR 3.4.6.2 | RCS Leakae Detection Instrumentation | NUREG(s)- 1433 Only |
| SR 3.4.6.2 Bases | RCS Leakae Detection Instrumentation | NUREG(s)- 1433 Only |
| SR 3.4.6.3 | RCS Leakae Detection Instrumentation | NUREG(s)- 1433 Only |
| SR 3.4.6.3 Bases | RCS Leakae Detection Instrumentation | NUREG(s)- 1433 Only |
| SR 3.4.7.1 | RCS Specific Activity | NUREG(s)- 1433 Only |
| SR 3.4.7.1 Bases | RCS Specific Activity | NUREG(s)- 1433 Only |
| SR 3.4.8.1 | RHR Shutdown Cooling System - Hot Shutdown | NUREG(s)- 1433 Only |
| SR 3.4.8.1 Bases | RHR Shutdown Cooling System - Hot Shutdown | NUREG(s)- 1433 Only |
| SR 3.4.9.1 | RHR Shutdown Cooling System - Cold Shutdown | NUREG(s)- 1433 Only |
| SR 3.4.9.1 Bases | RHR Shutdown Cooling System - Cold Shutdown | NUREG(s)- 1433 Only |
| SR 3.4.10.1 | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.1 Bases | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.7 | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.7 Bases | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.8 | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.8 Bases | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.9 | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.10.9 Bases | RCS P/T Limits | NUREG(s)- 1433 Only |
| SR 3.4.11.1 | Reactor Steam Dome Pressure | NUREG(s)- 1433 Only |
| SR 3.4.11.1 Bases | Reactor Steam Dome Pressure | NUREG(s)- 1433 Only |
| SR 3.5.1.8 | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.8 Bases | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.9 | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.9 Bases | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.10 | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.10 Bases | ECCS - Operating | NUREG(s)- 1433 Only |



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| SR 3.5.1.11 | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.11 Bases | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.12 | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.5.1.12 Bases | ECCS - Operating | NUREG(s)- 1433 Only |
| SR 3.6.1.1.2 | Primary Containment | NUREG(s)- 1433 Only |
| SR 3.6.1.1.2 Bases | Primary Containment | NUREG(s)- 1433 Only |
| SR 3.6.1.3.9 | PCIVs | NUREG(s)- 1433 Only |
| SR 3.6.1.3.11 | PCIVs | NUREG(s)- 1433 Only |
| SR 3.6.1.3.15 | PCIVs | NUREG(s)- 1433 Only |
| SR 3.6.1.4.1 | Drywell Pressure | NUREG(s)- 1433 Only |
| SR 3.6.1.4.1 Bases | Drywell Pressure | NUREG(s)- 1433 Only |
| SR 3.6.1.5.1 | Drywell Air Temperature | NUREG(s)- 1433 Only |
| SR 3.6.1.5.1 Bases | Drywell Air Temperature | NUREG(s)- 1433 Only |
| SR 3.6.1.7.1 | Reactor Building-to-Supression Chamber Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.7.1 Bases | Reactor Building-to-Supression Chamber Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.7.2 | Reactor Building-to-Supression Chamber Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.7.2 Bases | Reactor Building-to-Supression Chamber Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.7.3 | Reactor Building-to-Supression Chamber Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.7.3 Bases | Reactor Building-to-Supression Chamber Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.8.1 | Supression Chamber-to-Drywell Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.8.1 Bases | Supression Chamber-to-Drywell Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.8.2 | Supression Chamber-to-Drywell Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.8.2 Bases | Supression Chamber-to-Drywell Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.8.3 | Supression Chamber-to-Drywell Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.1.8.3 Bases | Supression Chamber-to-Drywell Vacuum Breakers | NUREG(s)- 1433 Only |
| SR 3.6.2.4.1 | RHR Suppression Pool Spray | NUREG(s)- 1433 Only |
| SR 3.6.2.4.1 Bases | RHR Suppression Pool Spray | NUREG(s)- 1433 Only |



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| SR 3.6.2.4.2 | RHR Suppression Pool Spray | NUREG(s)- 1433 Only |
| SR 3.6.2.4.2 Bases | RHR Suppression Pool Spray | NUREG(s)- 1433 Only |
| SR 3.6.2.5.1 | Drywell-to-Suppression Chamber Differential Pressure | NUREG(s)- 1433 Only |
| SR 3.6.2.5.1 Bases | Drywell-to-Suppression Chamber Differential Pressure | NUREG(s)- 1433 Only |
| SR 3.6.3.1.1 | Drywell Cooling System Fans | NUREG(s)- 1433 Only |
| SR 3.6.3.1.1 Bases | Drywell Cooling System Fans | NUREG(s)- 1433 Only |
| SR 3.6.3.1.2 | Drywell Cooling System Fans | NUREG(s)- 1433 Only |
| SR 3.6.3.1.2 Bases | Drywell Cooling System Fans | NUREG(s)- 1433 Only |
| SR 3.6.3.2.1 | Primary Containment Oxygen Concentration | NUREG(s)- 1433 Only |
| SR 3.6.3.2.1 Bases | Primary Containment Oxygen Concentration | NUREG(s)- 1433 Only |
| SR 3.6.3.3.1 | CAD System | NUREG(s)- 1433 Only |
| SR 3.6.3.3.1 Bases | CAD System | NUREG(s)- 1433 Only |
| SR 3.6.3.3.2 | CAD System | NUREG(s)- 1433 Only |
| SR 3.6.3.3.2 Bases | CAD System | NUREG(s)- 1433 Only |
| SR 3.7.1.1 | RHRSW System | NUREG(s)- 1433 Only |
| SR 3.7.1.1 Bases | RHRSW System | NUREG(s)- 1433 Only |
| SR 3.7.2.1 | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.1 Bases | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.2 | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.2 Bases | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.3 | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.3 Bases | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.4 | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.4 Bases | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.5 | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.5 Bases | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.2.6 | [PSW] System and [UHS} | NUREG(s)- 1433 Only |



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| SR 3.7.2.6 Bases | [PSW] System and [UHS} | NUREG(s)- 1433 Only |
| SR 3.7.3.1 | DB[1B] SSW System | NUREG(s)- 1433 Only |
| SR 3.7.3.1 Bases | DB[1B] SSW System | NUREG(s)- 1433 Only |
| SR 3.7.3.2 | DB[1B] SSW System | NUREG(s)- 1433 Only |
| SR 3.7.3.2 Bases | DB[1B] SSW System | NUREG(s)- 1433 Only |
| SR 3.7.4.1 | [MCREC] System | NUREG(s)- 1433 Only |
| SR 3.7.4.1 Bases | [MCREC] System | NUREG(s)- 1433 Only |
| SR 3.7.4.3 | [MCREC] System | NUREG(s)- 1433 Only |
| SR 3.7.4.3 Bases | [MCREC] System | NUREG(s)- 1433 Only |
| SR 3.7.4.4 | [MCREC] System | NUREG(s)- 1433 Only |
| SR 3.7.4.4 Bases | [MCREC] System | NUREG(s)- 1433 Only |
| SR 3.7.5.1 | [Control Room AC] System | NUREG(s)- 1433 Only |
| SR 3.7.5.1 Bases | [Control Room AC] System | NUREG(s)- 1433 Only |
| SR 3.7.6.1 | Main Condenser Offgas System | NUREG(s)- 1433 Only |
| SR 3.7.6.1 Bases | Main Condenser Offgas System | NUREG(s)- 1433 Only |
| SR 3.7.7.1 | Main Turbine Bypass System | NUREG(s)- 1433 Only |
| SR 3.7.7.1 Bases | Main Turbine Bypass System | NUREG(s)- 1433 Only |
| SR 3.7.7.2 | Main Turbine Bypass System | NUREG(s)- 1433 Only |
| SR 3.7.7.2 Bases | Main Turbine Bypass System | NUREG(s)- 1433 Only |
| SR 3.7.7.3 | Main Turbine Bypass System | NUREG(s)- 1433 Only |
| SR 3.7.7.3 Bases | Main Turbine Bypass System | NUREG(s)- 1433 Only |
| SR 3.7.8.1 | Spent Fuel Storage Pool Water Level | NUREG(s)- 1433 Only |
| SR 3.7.8.1 Bases | Spent Fuel Storage Pool Water Level | NUREG(s)- 1433 Only |
| SR 3.3.2.1.8 | Control Rod Block Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.2.1.8 Bases | Control Rod Block Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.1 | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.1 Bases | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |



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| SR 3.3.6.3.2 | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.2 Bases | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.3 | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.3 Bases | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.4 | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.4 Bases | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.5 | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.5 Bases | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.6 | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.3.6 Bases | RHR Containment Spray System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.1 | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.1 Bases | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.2 | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.2 Bases | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.3 | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.3 Bases | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.4 | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.4 Bases | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.5 | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.5 Bases | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.6 | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.4.6 Bases | SPMU System Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.1 | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.1 Bases | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.2 | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.2 Bases | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.3 | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |



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| SR 3.3.6.5.3 Bases | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.4 | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.6.5.4 Bases | Relief and LLS Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.1 | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.1 Bases | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.2 | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.2 Bases | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.3 | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.3 Bases | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.4 | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.4 Bases | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.5 | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.3.7.5 Bases | [CRFA] Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.2.1 | FCVs | NUREG(s)- 1434 Only |
| SR 3.4.2.1 Bases | FCVs | NUREG(s)- 1434 Only |
| SR 3.4.2.2 | FCVs | NUREG(s)- 1434 Only |
| SR 3.4.2.2 Bases | FCVs | NUREG(s)- 1434 Only |
| SR 3.4.3.1 | Jet Pumps | NUREG(s)- 1434 Only |
| SR 3.4.3.1 Bases | Jet Pumps | NUREG(s)- 1434 Only |
| SR 3.4.4.1 | S/RVs | NUREG(s)- 1434 Only |
| SR 3.4.4.1 Bases | S/RVs | NUREG(s)- 1434 Only |
| SR 3.4.4.2 | S/RVs | NUREG(s)- 1434 Only |
| SR 3.4.4.2 Bases | S/RVs | NUREG(s)- 1434 Only |
| SR 3.4.4.3 | S/RVs | NUREG(s)- 1434 Only |
| SR 3.4.4.3 Bases | S/RVs | NUREG(s)- 1434 Only |
| SR 3.4.5.1 | RCS Operational Leakage | NUREG(s)- 1434 Only |
| SR 3.4.5.1 Bases | RCS Operational Leakage | NUREG(s)- 1434 Only |



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| SR 3.4.6.1 | RCS PIV Leakage | NUREG(s)- 1434 Only |
| SR 3.4.6.1 Bases | RCS PIV Leakage | NUREG(s)- 1434 Only |
| SR 3.4.7.1 | RCS Leakae Detection Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.7.1 Bases | RCS Leakae Detection Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.7.2 | RCS Leakae Detection Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.7.2 Bases | RCS Leakae Detection Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.7.3 | RCS Leakae Detection Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.7.3 Bases | RCS Leakae Detection Instrumentation | NUREG(s)- 1434 Only |
| SR 3.4.8.1 | RCS Specific Activity | NUREG(s)- 1434 Only |
| SR 3.4.8.1 Bases | RCS Specific Activity | NUREG(s)- 1434 Only |
| SR 3.4.9.1 | RHR Shutdown Cooling System - Hot Shutdown | NUREG(s)- 1434 Only |
| SR 3.4.9.1 Bases | RHR Shutdown Cooling System - Hot Shutdown | NUREG(s)- 1434 Only |
| SR 3.4.10.1 | RHR Shutdown Cooling System - Cold Shutdown | NUREG(s)- 1434 Only |
| SR 3.4.10.1 Bases | RHR Shutdown Cooling System - Cold Shutdown | NUREG(s)- 1434 Only |
| SR 3.4.11.1 | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.1 Bases | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.7 | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.7 Bases | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.8 | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.8 Bases | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.9 | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.11.9 Bases | RCS P/T Limits | NUREG(s)- 1434 Only |
| SR 3.4.12.1 | Reactor Steam Dome Pressure | NUREG(s)- 1434 Only |
| SR 3.4.12.1 Bases | Reactor Steam Dome Pressure | NUREG(s)- 1434 Only |
| SR 3.5.1.6 | ECCS - Operating | NUREG(s)- 1434 Only |
| SR 3.5.1.6 Bases | ECCS - Operating | NUREG(s)- 1434 Only |
| SR 3.6.1.2.3 | Primary Containment Air Locks | NUREG(s)- 1434 Only |



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| SR 3.6.1.2.3 Bases | Primary Containment Air Locks | NUREG(s)- 1434 Only |
| SR 3.6.1.2.4 | Primary Containment Air Locks | NUREG(s)- 1434 Only |
| SR 3.6.1.2.4 Bases | Primary Containment Air Locks | NUREG(s)- 1434 Only |
| SR 3.6.1.3.12 | PCIVs | NUREG(s)- 1434 Only |
| SR 3.6.1.4.1 | Primary Containment Pressure | NUREG(s)- 1434 Only |
| SR 3.6.1.4.1 Bases | Primary Containment Pressure | NUREG(s)- 1434 Only |
| SR 3.6.1.5.1 | Primary Containment Air Temperature | NUREG(s)- 1434 Only |
| SR 3.6.1.5.1 Bases | Primary Containment Air Temperature | NUREG(s)- 1434 Only |
| SR 3.6.1.7.1 | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.1 Bases | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.2 | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.2 Bases | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.3 | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.3 Bases | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.4 | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.7.4 Bases | RHR Containment Spray System | NUREG(s)- 1434 Only |
| SR 3.6.1.8.1 | PVLCS | NUREG(s)- 1434 Only |
| SR 3.6.1.8.1 Bases | PVLCS | NUREG(s)- 1434 Only |
| SR 3.6.1.8.2 | PVLCS | NUREG(s)- 1434 Only |
| SR 3.6.1.8.2 Bases | PVLCS | NUREG(s)- 1434 Only |
| SR 3.6.2.4.1 | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.1 Bases | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.2 | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.2 Bases | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.3 | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.3 Bases | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.4 | SPMU System | NUREG(s)- 1434 Only |



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| SR 3.6.2.4.4 Bases | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.5 | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.2.4.5 Bases | SPMU System | NUREG(s)- 1434 Only |
| SR 3.6.3.1.1 | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.1 Bases | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.2 | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.2 Bases | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.3 | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.3 Bases | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.4 | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.1.4 Bases | Primary Containment and Drywell Hydrogen Ignitors | NUREG(s)- 1434 Only |
| SR 3.6.3.2.1 | Drywell Purge System | NUREG(s)- 1434 Only |
| SR 3.6.3.2.1 Bases | Drywell Purge System | NUREG(s)- 1434 Only |
| SR 3.6.3.2.2 | Drywell Purge System | NUREG(s)- 1434 Only |
| SR 3.6.3.2.2 Bases | Drywell Purge System | NUREG(s)- 1434 Only |
| SR 3.6.5.1.1 | Drywell | NUREG(s)- 1434 Only |
| SR 3.6.5.1.1 Bases | Drywell | NUREG(s)- 1434 Only |
| SR 3.6.5.1.2 | Drywell | NUREG(s)- 1434 Only |
| SR 3.6.5.1.2 Bases | Drywell | NUREG(s)- 1434 Only |
| SR 3.6.5.2.1 | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.1 Bases | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.2 | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.2 Bases | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.3 | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.3 Bases | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.4 | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.4 Bases | Drywell Air Lock | NUREG(s)- 1434 Only |



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| SR 3.6.5.2.5 | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.2.5 Bases | Drywell Air Lock | NUREG(s)- 1434 Only |
| SR 3.6.5.3.1 | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.1 Bases | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.2 | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.2 Bases | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.4 | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.4 Bases | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.5 | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.5 Bases | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.6 | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.3.6 Bases | Drywell Isolation Valves | NUREG(s)- 1434 Only |
| SR 3.6.5.4.1 | Drywell Pressure | NUREG(s)- 1434 Only |
| SR 3.6.5.4.1 Bases | Drywell Pressure | NUREG(s)- 1434 Only |
| SR 3.6.5.5.1 | Drywell Air Temperature | NUREG(s)- 1434 Only |
| SR 3.6.5.5.1 Bases | Drywell Air Temperature | NUREG(s)- 1434 Only |
| SR 3.6.5.6.1 | Drywell Vacuum Relief System | NUREG(s)- 1434 Only |
| SR 3.6.5.6.1 Bases | Drywell Vacuum Relief System | NUREG(s)- 1434 Only |
| SR 3.6.5.6.2 | Drywell Vacuum Relief System | NUREG(s)- 1434 Only |
| SR 3.6.5.6.2 Bases | Drywell Vacuum Relief System | NUREG(s)- 1434 Only |
| SR 3.6.5.6.3 | Drywell Vacuum Relief System | NUREG(s)- 1434 Only |
| SR 3.6.5.6.3 Bases | Drywell Vacuum Relief System | NUREG(s)- 1434 Only |
| SR 3.7.1.1 | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.1 Bases | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.2 | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.2 Bases | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.3 | [SSW] System and [UHS] | NUREG(s)- 1434 Only |



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| | | |
|---|---|---|
| SR 3.7.1.3 Bases | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.4 | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.4 Bases | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.5 | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.5 Bases | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.6 | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.1.6 Bases | [SSW] System and [UHS] | NUREG(s)- 1434 Only |
| SR 3.7.2.1 | HPCS SWS | NUREG(s)- 1434 Only |
| SR 3.7.2.1 Bases | HPCS SWS | NUREG(s)- 1434 Only |
| SR 3.7.2.2 | HPCS SWS | NUREG(s)- 1434 Only |
| SR 3.7.2.2 Bases | HPCS SWS | NUREG(s)- 1434 Only |
| SR 3.7.2.3 | HPCS SWS | NUREG(s)- 1434 Only |
| SR 3.7.2.3 Bases | HPCS SWS | NUREG(s)- 1434 Only |
| SR 3.7.3.1 | | NUREG(s)- 1434 Only |
| SR 3.7.3.1 Bases | | NUREG(s)- 1434 Only |
| SR 3.7.3.3 | | NUREG(s)- 1434 Only |
| SR 3.7.3.3 Bases | | NUREG(s)- 1434 Only |
| SR 3.7.3.4 | | NUREG(s)- 1434 Only |
| SR 3.7.3.4 Bases | | NUREG(s)- 1434 Only |
| SR 3.7.4.1 | [Control Room AC] System | NUREG(s)- 1434 Only |
| SR 3.7.4.1 Bases | [Control Room AC] System | NUREG(s)- 1434 Only |
| SR 3.7.5.1 | Main Condenser Offgas System | NUREG(s)- 1434 Only |
| SR 3.7.5.1 Bases | Main Condenser Offgas System | NUREG(s)- 1434 Only |
| SR 3.7.6.1 | Main Turbine Bypass System | NUREG(s)- 1434 Only |
| SR 3.7.6.1 Bases | Main Turbine Bypass System | NUREG(s)- 1434 Only |
| SR 3.7.6.2 | Main Turbine Bypass System | NUREG(s)- 1434 Only |
| SR 3.7.6.2 Bases | Main Turbine Bypass System | NUREG(s)- 1434 Only |



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| | | |
|---|---|---|
| SR 3.7.6.3 | Main Turbine Bypass System | NUREG(s)- 1434 Only |
| SR 3.7.6.3 Bases | Main Turbine Bypass System | NUREG(s)- 1434 Only |
| SR 3.7.7.1 | Fuel Pool Water Level | NUREG(s)- 1434 Only |
| SR 3.7.7.1 Bases | Fuel Pool Water Level | NUREG(s)- 1434 Only |



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**INSERT 1**

OR

In accordance with the
Surveillance Frequency
Control Program ]

**INSERT 2**

OR

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

---------- REVIEWER'S NOTE ----------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---------- ]

**INSERT 3**

5.5.15 Surveillance Frequency Control Program

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

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

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-XX, "Title."

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

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.1.3.1 | Determine the position of each control rod. | [24 hours |
| SR 3.1.3.2 | ----------NOTE----------<br>Not required to be performed until 7 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of RWM.<br>----------<br><br>Insert each fully withdrawn control rod at least one notch. | [7 days<br>INSERT 1 |
| SR 3.1.3.3 | ----------NOTE----------<br>Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM.<br>----------<br><br>Insert each partially withdrawn control rod at least one notch. | [31 days |
| SR 3.1.3.4 | Verify each control rod scram time from fully withdrawn to notch position [06] is ≤ 7 seconds. | In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4 |
| SR 3.1.3.5 | Verify each control rod does not go to the withdrawn overtravel position. | Each time the control rod is withdrawn to "full out" position<br><br>AND<br><br>Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect coupling |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

The position of each control rod must be determined to ensure adequate information on control rod position is available to the operator for determining CRD OPERABILITY and controlling rod patterns. Control rod position may be determined by the use of OPERABLE position indicators, by moving control rods to a position with an OPERABLE indicator, or by the use of other appropriate methods. The 24 hour Frequency of this SR is based on operating experience related to expected changes in control rod position and the availability of control rod position indications in the control room.

INSERT 2

SR 3.1.3.2 and SR 3.1.3.3

Control rod insertion capability is demonstrated by inserting each partially or fully withdrawn control rod at least one notch and observing that the control rod moves. The control rod may then be returned to its original position. This ensures the control rod is not stuck and is free to insert on a scram signal. These Surveillances are not required when THERMAL POWER is less than or equal to the actual LPSP of the RWM, since the notch insertions may not be compatible with the requirements of the Banked Position Withdrawal Sequence (BPWS) (LCO 3.1.6) and the RWM (LCO 3.3.2.1). The 7 day Frequency of SR 3.1.3.2 is based on operating experience related to the changes in CRD performance and the ease of performing notch testing for fully withdrawn control rods. Partially withdrawn control rods are tested at a 31 day Frequency, based on the potential power reduction required to allow the control rod movement and considering the large testing sample of SR 3.1.3.2. Furthermore, the 31 day Frequency takes into account operating experience related to changes in CRD performance. At any time, if a control rod is immovable, a determination of that control rod's trippability (OPERABILITY) must be made and appropriate action taken.

SR 3.1.3.4

Verifying that the scram time for each control rod to notch position 06 is ≤ 7 seconds provides reasonable assurance that the control rod will insert when required during a DBA or transient, thereby completing its shutdown function. This SR is performed in conjunction with the control rod scram time testing of SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1, "Reactor

## 3.1 REACTIVITY CONTROL SYSTEMS

### 3.1.4 Control Rod Scram Times

LCO 3.1.4

a. No more than [10] OPERABLE control rods shall be "slow," in accordance with Table 3.1.4-1, and

b. No more than 2 OPERABLE control rods that are "slow" shall occupy adjacent locations.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Requirements of the LCO not met. | A.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

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

Insert 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time following a shutdown ≥ 120 days or longer, control rods are required to be tested before exceeding 40% RTP following the shutdown. This Frequency is acceptable considering the additional surveillances performed for control rod OPERABILITY, the frequent verification of adequate accumulator pressure, and the required testing of control rods affected by fuel movement within the associated core cell and by work on control rods or the CRD System.

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. The sample remains representative if no more than 20% of the control rods in the sample tested are determined to be "slow." With more than 20% of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 20% criterion (e.g., 20% of the entire sample size) is satisfied, or until the total number of "slow" control rods (throughout the core, from all surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. [The 120 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."

Insert 2

SR 3.1.4.3

When work that could affect the scram insertion time is performed on a control rod or the CRD System, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.5.1 | Verify each control rod scram accumulator pressure is ≥ [940] psig. | [7 days INSERT 1 |

BASES

ACTIONS (continued)

degraded during a depressurization event or at low reactor pressures. Therefore, immediately upon discovery of charging water header pressure < 940 psig, concurrent with Condition C, all control rods associated with inoperable accumulators must be verified to be fully inserted. Withdrawn control rods with inoperable accumulators may fail to scram under these low pressure conditions. The associated control rods must also be declared inoperable within 1 hour. The allowed Completion Time of 1 hour is reasonable for Required Action C.2, considering the low probability of a DBA or transient occurring during the time that the accumulator is inoperable.

D.1

The reactor mode switch must be immediately placed in the shutdown position if either Required Action and associated Completion Time associated with loss of the CRD charging pump (Required Actions B.1 and C.1) cannot be met. This ensures that all insertable control rods are inserted and that the reactor is in a condition that does not require the active function (i.e., scram) of the control rods. This Required Action is modified by a Note stating that the action is not applicable if all control rods associated with the inoperable scram accumulators are fully inserted, since the function of the control rods has been performed.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

periodically

SR 3.1.5.1 requires that the accumulator pressure be checked every 7 days to ensure adequate accumulator pressure exists to provide sufficient scram force. The primary indicator of accumulator OPERABILITY is the accumulator pressure. A minimum accumulator pressure is specified, below which the capability of the accumulator to perform its intended function becomes degraded and the accumulator is considered inoperable. The minimum accumulator pressure of 940 psig is well below the expected pressure of 1100 psig (Ref. 1). Declaring the accumulator inoperable when the minimum pressure is not maintained ensures that significant degradation in scram times does not occur. The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.

INSERT 2

REFERENCES

1. FSAR, Section [4.2.3.2.2.4].
2. FSAR, Section [5A.4.3].
3. FSAR, Section [15.1].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.2 Place the reactor mode switch in the shutdown position. | 1 hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.6.1 | Verify all OPERABLE control rods comply with [BPWS]. | [24 hours Insert 1 |

BASES

ACTIONS (continued)

Required Action A.1 is modified by a Note which allows the RWM to be bypassed to allow the affected control rods to be returned to their correct position. LCO 3.3.2.1 requires verification of control rod movement by a qualified member of the technical staff. This ensures that the control rods will be moved to the correct position. A control rod not in compliance with the prescribed sequence is not considered inoperable except as required by Required Action A.2. OPERABILITY of control rods is determined by compliance with LCO 3.1.3, "Control Rod OPERABILITY," LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators." The allowed Completion Time of 8 hours is reasonable, considering the restrictions on the number of allowed out of sequence control rods and the low probability of a CRDA occurring during the time the control rods are out of sequence.

B.1 and B.2

If nine or more OPERABLE control rods are out of sequence, the control rod pattern significantly deviates from the prescribed sequence. Control rod withdrawal should be suspended immediately to prevent the potential for further deviation from the prescribed sequence. Control rod insertion to correct control rods withdrawn beyond their allowed position is allowed since, in general, insertion of control rods has less impact on control rod worth than withdrawals have. Required Action B.1 is modified by a Note which allows the RWM to be bypassed to allow the affected control rods to be returned to their correct position. LCO 3.3.2.1 requires verification of control rod movement by a qualified member of the technical staff.

When nine or more OPERABLE control rods are not in compliance with BPWS, the reactor mode switch must be placed in the shutdown position within 1 hour. With the mode switch in shutdown, the reactor is shut down, and as such, does not meet the applicability requirements of this LCO. The allowed Completion Time of 1 hour is reasonable to allow insertion of control rods to restore compliance, and is appropriate relative to the low probability of a CRDA occurring with the control rods out of sequence.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

periodically

The control rod pattern is verified to be in compliance with the BPWS at a 24 hour Frequency to ensure the assumptions of the CRDA analyses are met. The 24 hour Frequency was developed considering that the primary check on compliance with the BPWS is performed by the RWM (LCO 3.3.2.1). which provides control rod blocks to enforce the required sequence and is required to be OPERABLE when operating at ≤ [10]% RTP.

Insert 2

The RWM

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.1 | Verify available volume of sodium pentaborate solution is [within the limits of Figure 3.1.7-1, or ≥ [4530] gallons]. | [24 hours |
| SR 3.1.7.2 | [ Verify temperature of sodium pentaborate solution is within the limits of [Figure 3.1.7-2]. | [24 hours ] |
| SR 3.1.7.3 | [ Verify temperature of pump suction piping is within the limits of [Figure 3.1.7-2]. | [24 hours ] |
| SR 3.1.7.4 | Verify continuity of explosive charge. | [31 days |
| SR 3.1.7.5 | Verify the concentration of boron in solution is [within the limits of Figure 3.1.7-1]. | [31 days<br>AND<br>Once within 24 hours after water or boron is added to solution<br>AND<br>Once within 24 hours after solution temperature is restored within the limits of [Figure 3.1.7-2] |
| SR 3.1.7.6 | Verify each SLC subsystem manual, power operated, [and automatic valve] in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.7 | Verify each pump develops a flow rate ≥ [41.2] gpm at a discharge pressure ≥ [1190] psig. | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.1.7.8 | Verify flow through one SLC subsystem from pump into reactor pressure vessel. | [18] months on a STAGGERED TEST BASIS |
| SR 3.1.7.9 | [ Verify all heat traced piping between storage tank and pump suction is unblocked. | [18] months<br><br>AND<br><br>Once within 24 hours after solution temperature is restored within the limits of [Figure 3.1.7-2] ] |
| SR 3.1.7.10 | [ Verify sodium pentaborate enrichment is ≥ [60.0] atom percent B-10. | Prior to addition to SLC tank ] |

INSERT 1

BASES

ACTIONS (continued)

C.1

If both SLC subsystems are inoperable for reasons other than Condition A, at least one subsystem must be restored to OPERABLE status within 8 hours. The allowed Completion Time of 8 hours is considered acceptable given the low probability of a DBA or transient occurring concurrent with the failure of the control rods to shut down the reactor.

D.1

If any Required Action and associated Completion Time is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1, SR 3.1.7.2, and SR 3.1.7.3

SR 3.1.7.1 through SR 3.1.7.3 are 24 hour Surveillances verifying certain characteristics of the SLC System (e.g., the volume and temperature of the borated solution in the storage tank), thereby ensuring SLC System OPERABILITY without disturbing normal plant operation. These Surveillances ensure that the proper borated solution volume and temperature, including the temperature of the pump suction piping, are maintained. Maintaining a minimum specified borated solution temperature is important in ensuring that the boron remains in solution and does not precipitate out in the storage tank or in the pump suction piping. The temperature versus concentration curve of Figure 3.1.7-2 ensures that a 10°F margin will be maintained above the saturation temperature. The 24 hour Frequency is based on operating experience and has shown there are relatively slow variations in the measured parameters of volume and temperature.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.7.4 and SR 3.1.7.6

SR 3.1.7.4 verifies the continuity of the explosive charges in the injection valves to ensure that proper operation will occur if required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. The 31 day Frequency is based on operating experience and has demonstrated the reliability of the explosive charge continuity.

SR 3.1.7.6 verifies that each valve in the system is in its correct position, but does not apply to the squib (i.e., explosive) valves. Verifying the correct alignment for manual, power operated, and automatic valves in the SLC System flow path provides assurance that the proper flow paths will exist for system operation. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position *from the control room, or locally by a dedicated operator at the valve* control. This is acceptable since the SLC System is a manually initiated system. This Surveillance also does not apply to valves that are locked, sealed, or otherwise secured in position since they are verified to be in the correct position prior to locking, sealing, or securing. This verification of valve alignment does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. The 31 day Frequency is based on engineering judgment and is consistent with the procedural controls governing valve operation that ensures correct valve positions.

INSERT 2

SR 3.1.7.5

This Surveillance requires an examination of the sodium pentaborate solution by using chemical analysis to ensure that the proper concentration of boron exists in the storage tank. SR 3.1.7.5 must be performed anytime boron or water is added to the storage tank solution to determine that the boron solution concentration is within the specified limits. SR 3.1.7.5 must also be performed anytime the temperature is restored to within the limits of Figure 3.1.7-2, to ensure that no significant *boron precipitation occurred. The 31 day Frequency of this Surveillance* is appropriate because of the relatively slow variation of boron concentration between surveillances.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.7.7

Demonstrating that each SLC System pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1190 psig ensures that pump performance has not degraded during the fuel cycle. This minimum pump flow rate requirement ensures that, when combined with the sodium pentaborate solution concentration requirements, the rate of negative reactivity insertion from the SLC System will adequately compensate for the positive reactivity effects encountered during power reduction, cooldown of the moderator, and xenon decay. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this Surveillance is [in accordance with the Inservice Testing Program or 92 days].

SR 3.1.7.8 and SR 3.1.7.9

These Surveillances ensure that there is a functioning flow path from the boron solution storage tank to the RPV, including the firing of an explosive valve. The replacement charge for the explosive valve shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of that batch successfully fired. The pump and explosive valve tested should be alternated such that both complete flow paths are tested every 36 months at alternating 18 month intervals. The Surveillance may be performed in separate steps to prevent injecting boron into the RPV. An acceptable method for verifying flow from the pump to the RPV is to pump demineralized water from a test tank through one SLC subsystem and into the RPV. The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

Demonstrating that all heat traced piping between the boron solution storage tank and the suction inlet to the injection pumps is unblocked ensures that there is a functioning flow path for injecting the sodium pentaborate solution. An acceptable method for verifying that the suction piping is unblocked is to pump from the storage tank to the test tank.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 18 month Frequency is acceptable since there is a low probability that the subject piping will be blocked due to precipitation of the boron from solution in the heat traced piping. This is especially true in light of the temperature verification of this piping required by SR 3.1.7.3. However, if, in performing SR 3.1.7.3, it is determined that the temperature of this piping has fallen below the specified minimum, SR 3.1.7.9 must be performed once within 24 hours after the piping temperature is restored to within the limits of Figure 3.1.7-2.

INSERT 2

SR 3.1.7.10

Enriched sodium pentaborate solution is made by mixing granular, enriched sodium pentaborate with water. Isotopic tests on the granular sodium pentaborate to verify the actual B-10 enrichment must be performed prior to addition to the SLC tank in order to ensure that the proper B-10 atom percentage is being used.

REFERENCES

1. 10 CFR 50.62.

2. FSAR, Section [4.2.3.4.3].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.8.1 | ----------NOTE----------<br>Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2.<br>----------<br><br>Verify each SDV vent and drain valve is open. | 31 days |
| SR 3.1.8.2 | Cycle each SDV vent and drain valve to the fully closed and fully open position. | 92 days |
| SR 3.1.8.3 | Verify each SDV vent and drain valve:<br><br>a. Closes in ≤ [60] seconds after receipt of an actual or simulated scram signal and<br><br>b. Opens when the actual or simulated scram signal is reset. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

B.1

If both valves in a line are inoperable, the line must be isolated to contain the reactor coolant during a scram.

The 8 hour Completion Time to isolate the line is based on the low probability of a scram occurring while the line is not isolated and unlikelihood of significant CRD seal leakage.

C.1

If any Required Action and associated Completion Time is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

During normal operation, the SDV vent and drain valves should be in the open position (except when performing SR 3.1.8.2) to allow for drainage of the SDV piping. Verifying that each valve is in the open position ensures that the SDV vent and drain valves will perform their intended functions during normal operation. This SR does not require any testing or valve manipulation; rather, it involves verification that the valves are in the correct position.

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

INSERT 2

SR 3.1.8.2

During a scram, the SDV vent and drain valves should close to contain the reactor water discharged to the SDV piping. Cycling each valve through its complete range of motion (closed and open) ensures that the valve will function properly during a scram. The 92 day Frequency is based on operating experience and takes into account the level of redundancy in the system design.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.3

SR 3.1.8.3 is an integrated test of the SDV vent and drain valves to verify total system performance. After receipt of a simulated or actual scram signal, the closure of the SDV vent and drain valves is verified. The closure time of 60 seconds after receipt of a scram signal is based on the bounding leakage case evaluated in the accident analysis (Ref. 2). Similarly, after receipt of a simulated or actual scram reset signal, the opening of the SDV vent and drain valves is verified. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1 and the scram time testing of control rods in LCO 3.1.3 overlap this Surveillance to provide complete testing of the assumed safety function. The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. FSAR, Section [4.2.3.2.2.3].

2. 10 CFR 100.

3. NUREG-0803, "Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping," August 1981.

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.1 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

LCO 3.2.1 All APLHGRs shall be less than or equal to the limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Any APLHGR not within limits. | A.1 Restore APLHGR(s) to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.1.1 | Verify all APLHGRs are less than or equal to the limits specified in the COLR. | Once within 12 hours after ≥ 25% RTP<br>AND<br>24 hours thereafter |

Insert 1

BASES

ACTIONS

A.1

If any APLHGR exceeds the required limits, an assumption regarding an initial condition of the DBA and transient analyses may not be met. Therefore, prompt action should be taken to restore the APLHGR(s) to within the required limits such that the plant operates within analyzed conditions and within design limits of the fuel rods. The 2 hour Completion Time is sufficient to restore the APLHGR(s) to within its limits and is acceptable based on the low probability of a transient or DBA occurring simultaneously with the APLHGR out of specification.

B.1

If the APLHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to in a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 25% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 25% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

periodically

APLHGRs are required to be initially calculated within 12 hours after THERMAL POWER is ≥ 25% RTP and then every 24 hours thereafter. They are compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels.

Insert 2

REFERENCES

1. NEDO-24011-P-A "General Electric Standard Application for Reactor Fuel" (latest approved version).
2. FSAR, Chapter [4].
3. FSAR, Chapter [6].
4. FSAR, Chapter [15].
5. [Plant specific single loop operation].
6. [Plant specific load line limit analysis].

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.2 MINIMUM CRITICAL POWER RATIO (MCPR)

LCO 3.2.2 All MCPRs shall be greater than or equal to the MCPR operating limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Any MCPR not within limits. | A.1 Restore MCPR(s) to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.2.1 | Verify all MCPRs are greater than or equal to the limits specified in the COLR. | Once within 12 hours after ≥ 25% RTP<br>AND<br>[24 hours thereafter |

Insert 1

BASES

ACTIONS (continued)

B.1

If the MCPR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 25% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 25% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

periodically

The MCPR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 25% RTP and then every 24 hours thereafter. It is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels.

Insert 2

SR 3.2.2.2

Because the transient analysis takes credit for conservatism in the scram speed performance, it must be demonstrated that the specific scram speed distribution is consistent with that used in the transient analysis. SR 3.2.2.2 determines the value of $\tau$, which is a measure of the actual scram speed distribution compared with the assumed distribution. The MCPR operating limit is then determined based on an interpolation between the applicable limits for Option A (scram times of LCO 3.1.4, "Control Rod Scram Times") and Option B (realistic scram times) analyses. The parameter $\tau$ must be determined once within 72 hours after each set of scram time tests required by SR 3.1.4.1, SR 3.1.4.2, and SR 3.1.4.4 because the effective scram speed distribution may change during the cycle or after maintenance that could affect scram times. The 72 hour Completion Time is acceptable due to the relatively minor changes in $\tau$ expected during the fuel cycle.

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.3 LINEAR HEAT GENERATION RATE (LHGR) (Optional)

LCO 3.2.3 All LHGRs shall be less than or equal to the limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Any LHGR not within limits. | A.1 Restore LHGR(s) to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.3.1 | Verify all LHGRs are less than or equal to the limits specified in the COLR. | Once within 12 hours after ≥ 25% RTP<br><br>AND<br><br>24 hours thereafter |

Insert 1

BASES

LCO

The LHGR is a basic assumption in the fuel design analysis. The fuel has been designed to operate at rated core power with sufficient design margin to the LHGR calculated to cause a 1% fuel cladding plastic strain. The operating limit to accomplish this objective is specified in the COLR.

APPLICABILITY

The LHGR limits are derived from fuel design analysis that is limiting at high power level conditions. At core thermal power levels < 25% RTP, the reactor is operating with a substantial margin to the LHGR limits and, therefore, the Specification is only required when the reactor is operating at ≥ 25% RTP.

ACTIONS

A.1

If any LHGR exceeds its required limit, an assumption regarding an initial condition of the fuel design analysis is not met. Therefore, prompt action should be taken to restore the LHGR(s) to within its required limits such that the plant is operating within analyzed conditions. The 2 hour Completion Time is normally sufficient to restore the LHGR(s) to within its limits and is acceptable based on the low probability of a transient or Design Basis Accident occurring simultaneously with the LHGR out of specification.

B.1

If the LHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER is reduced to < 25% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER TO < 25% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

periodically

The LHGR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 25% RTP and ~~then every 24 hours~~ thereafter. It is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slow changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at lower power levels.

Insert 2

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.2.4.1 | ----------NOTE----------<br>Not required to be met if SR 3.2.4.2 is satisfied for LCO 3.2.4 Item b or c requirements.<br>----------<br><br>Verify MFLPD is within limits. | Once within 12 hours after ≥ 25% RTP<br><br>AND<br><br>[24 hours thereafter |
| SR 3.2.4.2 | ----------NOTE----------<br>Not required to be met if SR 3.2.4.1 is satisfied for LCO 3.2.4 Item a requirements.<br>----------<br><br>Verify APRM setpoints or gains are adjusted for the calculated MFLPD. | Insert 1<br><br>[12 hours |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1 and SR 3.2.4.2

The MFLPD is required to be calculated and compared to FRTP or APRM gain or setpoints to ensure that the reactor is operating within the assumptions of the safety analysis. These SRs are only required to determine the MFLPD and, assuming MFLPD is greater than FRTP, the appropriate gain or setpoint, and is not intended to be a CHANNEL FUNCTIONAL TEST for the APRM gain or flow biased neutron flux scram circuitry. The 24 hour Frequency of SR 3.2.4.1 is chosen to coincide with the determination of other thermal limits, specifically those for the APLHGR (LCO 3.2.1). The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels.

of SR 3.2.4.1

The 12 hour Frequency of SR 3.2.4.2 requires a more frequent verification than if MFLPD is less than or equal to fraction of rated power (FRP). When MFLPD is greater than FRP, more rapid changes in power distribution are typically expected. Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10, GDC 13, GDC 20, and GDC 23.
2. FSAR, Section [ ].
3. FSAR, Section [ ].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | E.1 Reduce THERMAL POWER to < [30]% RTP. | 4 hours |
| F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | F.1 Be in MODE 2. | 6 hours |
| G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | G.1 Be in MODE 3. | 12 hours |
| H. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | H.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | [12 hours INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP.<br>----------<br><br>Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP [plus any gain adjustment required by LCO 3.2.4, "Average Power Range Monitor (APRM) Setpoints"] while operating at ≥ 25% RTP. | [7 days |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | [7 days |
| SR 3.3.1.1.4 | ----------NOTE----------<br>Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | [7 days |
| SR 3.3.1.1.5 | Perform CHANNEL FUNCTIONAL TEST. | [7 days |
| SR 3.3.1.1.6 | Calibrate the local power range monitors. | [1000 MWD/T average core exposure |
| SR 3.3.1.1.7 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.1.1.8 | [ Calibrate the trip units. | [[92] days] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.9 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL CALIBRATION. | [184 days |
| SR 3.3.1.1.10 | Perform CHANNEL FUNCTIONAL TEST. | [[18] months |
| SR 3.3.1.1.11 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.1.1.12 | Verify the APRM Flow Biased Simulated Thermal Power - High time constant is ≤ [7] seconds. | [[18] months |
| SR 3.3.1.1.13 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |
| SR 3.3.1.1.14 | Verify Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ [30]% RTP. | [[18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.15 | ----------NOTES----------<br>[1.] Neutron detectors are excluded.<br>[2. For Function 5 "n" equals 4 channels for the purpose of determining the the STAGGERED TEST BASIS Frequency.]<br>----------<br>Verify the RPS RESPONSE TIME is within limits. | [18] months on a STAGGERED TEST BASIS Insert 1 |

BASES

SURVEILLANCE REQUIREMENTS (continued)

As noted at the beginning of the SRs, the SRs for each RPS instrumentation Function are located in the SRs column of Table 3.3.1.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RPS trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 4) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The agreement criteria includes an expectation of one decade of overlap when transitioning between neutron flux instrumentation. The overlap between SRMs and IRMs must be demonstrated prior to withdrawing SRMs from the fully inserted position since indication is being transitioned from the SRMs to the IRMs. This will ensure that reactor power will not be increased into a neutron flux region without adequate indication. The overlap between IRMs and APRMs is of concern when reducing power into the IRM range (entry into MODE 2 from MODE 1). On power

BASES

SURVEILLANCE REQUIREMENTS (continued)

increases, the system design will prevent further increases (by initiating a rod block) if adequate overlap is not maintained. Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between MODE 1 and MODE 2 can be made without either APRM downscale rod block or IRM upscale rod block. Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above mid-scale on Range 1 before SRMs have reached the upscale rod block.

If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channels(s) declared inoperable. Only those appropriate channels that are required in the current MODE or condition should be declared inoperable.

INSERT 2

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance. LCO 3.2.4, "Average Power Range Monitor (APRM) Gain and Setpoints," allows the APRMs to be reading greater than actual THERMAL POWER to compensate for localized power peaking. When this adjustment is made, the requirement for the APRMs to indicate within 2% RTP of calculated power is modified to require the APRMs to indicate within 2% RTP of calculated MFLPD. The Frequency of once per 7 days is based on minor changes in LPRM sensitivity, which could affect the APRM reading between performances of SR 3.3.1.1.6. Insert 3

A restriction to satisfying this SR when < 25% RTP is provided that requires the SR to be met only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 25% RTP. At low power levels, a high degree of accuracy is unnecessary because of the large, inherent margin to thermal limits (MCPR and APLHGR). At ≥ 25% RTP, the

BASES

SURVEILLANCE REQUIREMENTS (continued)

Surveillance is required to have been satisfactorily performed within the last 7 days, in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 25% if the 7 day Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 25% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

SR 3.3.1.1.3

The Average Power Range Monitor Flow Biased Simulated Thermal Power - High Function uses the recirculation loop drive flows to vary the trip setpoint. This SR ensures that the total loop drive flow signals from the flow units used to vary the setpoint is appropriately compared to a calibrated flow signal and, therefore, the APRM Function accurately reflects the required setpoint as a function of flow. Each flow signal from the respective flow unit must be ≤ 105% of the calibrated flow signal. If the flow unit signal is not within the limit, one required APRM that receives an input from the inoperable flow unit must be declared inoperable.

INSERT 2

The Frequency of 7 days is based on engineering judgment, operating experience, and the reliability of this instrumentation.

SR 3.3.1.1.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specification tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

As noted, SR 3.3.1.1.4 is not required to be performed when entering MODE 2 from MODE 1, since testing of the MODE 2 required IRM and APRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This allows entry into MODE 2 if the 7 day Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after entering MODE 2 from MODE 1. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

A Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval and is based on reliability analysis (Ref. 9).

SR 3.3.1.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specification and non-Technical Specification tests at least once per refueling interval with applicable extensions. In accordance with Reference 10, the scram contacts must be tested as part of the Manual Scram Function. A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on the reliability analysis of Reference 11. (The Manual Scram Function's CHANNEL FUNCTIONAL TEST Frequency was credited in the analysis to extend many automatic scram Functions' Frequencies.)

INSERT 2

SR 3.3.1.1.6

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 1000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.7 and SR 3.3.1.1.10

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specification and non-Technical Specification tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The 92 day Frequency of SR 3.3.1.1.7 is based on the reliability analysis of Reference 10.

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

INSERT 2

SR 3.3.1.1.8

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.1.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 10.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.9 and SR 3.3.1.1.11

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

Note 1 states that neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 7 day calorimetric calibration (SR 3.3.1.1.2) and the 1000 MWD/T LPRM calibration against the TIPs (SR 3.3.1.1.6). A second Note is provided that requires the APRM and IRM SRs to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM and IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

The Frequency of SR 3.3.1.1.9 is based upon the assumption of a 184 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.1.1.11 is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.1.1.12

INSERT 2

The Average Power Range Monitor Flow Biased Simulated Thermal Power - High Function uses an electronic filter circuit to generate a signal proportional to the core THERMAL POWER from the APRM neutron flux signal. This filter circuit is representative of the fuel heat transfer dynamics that produce the relationship between the neutron flux and the core THERMAL POWER. The Surveillance filter time constant must be verified to be ≤ 7 seconds to ensure that the channel is accurately reflecting the desired parameter.

The Frequency of 18 months is based on engineering judgment considering the reliability of the components.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.13

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods (LCO 3.1.3), and SDV vent and drain valves (LCO 3.1.8), overlaps this Surveillance to provide complete testing of the assumed safety function.

The 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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.1.1.14

This SR ensures that scrams initiated from the Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 30% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. Because main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from turbine first stage pressure), the main turbine bypass valves must remain closed at THERMAL POWER ≥ 30% RTP to ensure that the calibration remains valid.

INSERT 2

If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 30% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve - Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel is considered OPERABLE.

The Frequency of 18 months is based on engineering judgment and reliability of the components.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.15

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. RPS RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[----------REVIEWER'S NOTE----------
The following Bases are applicable for plants adopting NEDO-32291-A and/or Supplement 1.
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However, the sensors for Functions 3 and 4 are allowed to be excluded from specific RPS RESPONSE TIME measurement if the conditions of Reference 12 are satisfied. If these conditions are satisfied, sensor response time may be allocated based on either assumed design sensor response time or the manufacturer's stated design response time. When the requirements of Reference 12 are not satisfied, sensor response time must be measured. Furthermore, measurement of the instrument loops response times for Functions 3 and 4 is not required if the conditions of Reference 13 are satisfied.] The RPS RESPONSE TIME acceptance criteria are included in Reference 11.

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time.

RPS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Note 2 requires STAGGERED TEST BASIS Frequency to be determined based on 4 channels per trip system, in lieu of the 8 channels specified in Table 3.3.1.1-1 for the MSIV Closure Function. This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

INSERT 2

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. One or more required SRMs inoperable in MODE 5. | E.1 Suspend CORE ALTERATIONS except for control rod insertion. | Immediately |
| | AND | |
| | E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.1 | Perform CHANNEL CHECK. | [12 hours |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.2 | ----------NOTES----------<br>1. Only required to be met during CORE ALTERATIONS.<br>2. One SRM may be used to satisfy more than one of the following.<br>----------<br>Verify an OPERABLE SRM detector is located in:<br>a. The fueled region,<br>b. The core quadrant where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region, and<br>c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region. | [12 hours |
| SR 3.3.1.2.3 | Perform CHANNEL CHECK. | [24 hours |
| SR 3.3.1.2.4 | ----------NOTE----------<br>Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.<br>----------<br>Verify count rate is:<br>a. ≥ [3.0] cps with a signal to noise ratio ≥ [2:1] or<br>b. ≥ [0.7] cps with a signal to noise ratio ≥ [20:1]. | [12 hours during CORE ALTERATIONS<br>AND<br>24 hours |
| SR 3.3.1.2.5 | Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio]. | [7 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.6 | ----------NOTE----------<br>Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio]. | [31 days |
| SR 3.3.1.2.7 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br><br>2. Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>----------<br><br>Perform CHANNEL CALIBRATION. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

INSERT 2

The Frequency of once every 12 hours for SR 3.3.1.2.1 is based on operating experience that demonstrates channel failure is rare. While in MODES 3 and 4, reactivity changes are not expected; therefore, the 12 hour Frequency is relaxed to 24 hours for SR 3.3.1.2.3. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.2.2

To provide adequate coverage of potential reactivity changes in the core, one SRM is required to be OPERABLE in the quadrant where CORE ALTERATIONS are being performed, and the other OPERABLE SRM must be in an adjacent quadrant containing fuel. Note 1 states that the SR is required to be met only during CORE ALTERATIONS. It is not required to be met at other times in MODE 5 since core reactivity changes are not occurring. This Surveillance consists of a review of plant logs to ensure that SRMs required to be OPERABLE for given CORE ALTERATIONS are, in fact, OPERABLE. In the event that only one SRM is required to be OPERABLE, per Table 3.3.1.2-1, footnote (b), only the a. portion of this SR is required. Note 2 clarifies that more than one of the three requirements can be met by the same OPERABLE SRM. The 12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities that include steps to ensure that the SRMs required by the LCO are in the proper quadrant.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.4

This Surveillance consists of a verification of the SRM instrument readout to ensure that the SRM reading is greater than a specified minimum count rate, which ensures that the detectors are indicating count rates indicative of neutron flux levels within the core. With few fuel assemblies loaded, the SRMs will not have a high enough count rate to satisfy the SR. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the minimum count rate.

To accomplish this, the SR is modified by a Note that states that the count rate is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated core quadrant, even with a control rod withdrawn, the configuration will not be critical.

The Frequency is based upon channel redundancy and other information available in the control room, and ensures that the required channels are frequently monitored while core reactivity changes are occurring. When no reactivity changes are in progress, the Frequency is relaxed from 12 hours to 24 hours.

INSERT 2

SR 3.3.1.2.5 and SR 3.3.1.2.6

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated channel will function properly. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. SR 3.3.1.2.5 is required in MODE 5 and the 7 day Frequency ensures that the channels are OPERABLE while core reactivity changes could be in progress. This Frequency is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK), that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.6 is required in MODE 2 with IRMs on Range 2 or below, and in MODES 3 and 4. Since core reactivity changes do not normally take place, the Frequency has been extended from 7 days to 31 days. The 31 day Frequency is based on operating experience and on other Surveillances (such as CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

INSERT 2

Verification of the signal to noise ratio also ensures that the detectors are inserted to an acceptable operating level. In a fully withdrawn condition, the detectors are sufficiently removed from the fueled region of the core to essentially eliminate neutrons from reaching the detector. Any count rate obtained while the detectors are fully withdrawn is assumed to be "noise" only.

The Note to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability (THERMAL POWER decreased to IRM Range 2 or below). The SR must be performed within 12 hours after IRMs are on Range 2 or below. The allowance to enter the Applicability with the 31 day Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

SR 3.3.1.2.7

Performance of a CHANNEL CALIBRATION at a ~~Frequency of~~ 18 months verifies the performance of the SRM detectors and associated circuitry. The Frequency considers the plant conditions required to perform the test, the ease of performing the test, and the likelihood of a change in the system or component status. The neutron detectors are excluded from the CHANNEL CALIBRATION because they cannot readily be adjusted. The detectors are fission chambers that are designed to have a relatively constant sensitivity over the range and with an accuracy specified for a fixed useful life.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the 18 month Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

REFERENCES None.

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.1 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.1.2 | ----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ [10]% RTP in MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.1.3 | ----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is ≤ [10]% RTP in MODE 1. ---------- Perform CHANNEL FUNCTIONAL TEST. | [92] days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.4 | ----------NOTE----------<br>[ Neutron detectors are excluded. ]<br>----------<br><br>Verify the RBM:<br><br>a. Low Power Range - Upscale Function is not bypassed when THERMAL POWER is ≥ 29% and ≤ 64% RTP.<br><br>b. Intermediate Power Range - Upscale Function is not bypassed when THERMAL POWER is > 64% and ≤ 84% RTP.<br><br>c. High Power Range - Upscale Function is not bypassed when THERMAL POWER is > 84% RTP. | [18] months |
| SR 3.3.2.1.5 | Verify the RWM is not bypassed when THERMAL POWER is ≤ [10]% RTP. | [18] months |
| SR 3.3.2.1.6 | ----------NOTE----------<br>Not required to be performed until 1 hour after reactor mode switch is in the shutdown position.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | [18] months |
| SR 3.3.2.1.7 | ----------NOTE----------<br>Neutron detectors are excluded.<br>----------<br><br>Perform CHANNEL CALIBRATION. | [18] months |
| SR 3.3.2.1.8 | Verify control rod sequences input to the RWM are in conformance with BPWS. | Prior to declaring RWM OPERABLE following loading of sequence into RWM |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.1

A CHANNEL FUNCTIONAL TEST is performed for each RBM channel to ensure that the entire channel will perform the intended function. It includes the Reactor Manual Control Multiplexing System input. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of 92 days is based on reliability analyses (Ref. 8).

SR 3.3.2.1.2 and SR 3.3.2.1.3

A CHANNEL FUNCTIONAL TEST is performed for the RWM to ensure that the entire system will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST for the RWM is performed by attempting to withdraw a control rod not in compliance with the prescribed sequence and verifying a control rod block occurs. As noted in the SRs, SR 3.3.2.1.2 is not required to be performed until 1 hour after any control rod is withdrawn in MODE 2. As noted, SR 3.3.2.1.3 is not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. This allows entry into MODE 2 for SR 3.3.2.1.2, and entry into MODE 1 when THERMAL POWER is ≤ 10% RTP for SR 3.3.2.1.3, to perform the required Surveillance if the 92 day Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs. The Frequencies are based on reliability analysis (Ref. 8).

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.4

The RBM setpoints are automatically varied as a function of power. Three Allowable Values are specified in Table 3.3.2.1-1, each within a specific power range. The power at which the control rod block Allowable Values automatically change are based on the APRM signal's input to each RBM channel. Below the minimum power setpoint, the RBM is automatically bypassed. These power Allowable Values must be verified periodically to be less than or equal to the specified values. If any power range setpoint is nonconservative, then the affected RBM channel is considered inoperable. Alternatively, the power range channel can be placed in the conservative condition (i.e., enabling the proper RBM setpoint). If placed in this condition, the SR is met and the RBM channel is not considered inoperable. As noted, neutron detectors are excluded from the Surveillance because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.6. The 18 month Frequency is based on the actual trip setpoint methodology utilized for these channels.

INSERT 2

SR 3.3.2.1.5

The RWM is automatically bypassed when power is above a specified value. The power level is determined from feedwater flow and steam flow signals. The automatic bypass setpoint must be verified periodically to be ≤ [10]% RTP. If the RWM low power setpoint is nonconservative, then the RWM is considered inoperable. Alternately, the low power setpoint channel can be placed in the conservative condition (nonbypass). If placed in the nonbypassed condition, the SR is met and the RWM is not considered inoperable. The Frequency is based on the trip setpoint methodology utilized for the low power setpoint channel.

SR 3.3.2.1.6

A CHANNEL FUNCTIONAL TEST is performed for the Reactor Mode Switch - Shutdown Position Function to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an

BASES

SURVEILLANCE REQUIREMENTS (continued)

acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST for the Reactor Mode Switch - Shutdown Position Function is performed by attempting to withdraw any control rod with the reactor mode switch in the shutdown position and verifying a control rod block occurs.

As noted in the SR, the Surveillance is not required to be performed until 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable links. This allows entry into MODES 3 and 4 if the 18 month Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.2.1.7

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

INSERT 2

As noted, neutron detectors are excluded from the CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.6.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2 Reduce THERMAL POWER to < [25]% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.2.1 | [ Perform CHANNEL CHECK. | [24 hours ] |
| SR 3.3.2.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.2.3 | Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ [58.0] inches. | [18] months |
| SR 3.3.2.2.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST including [valve] actuation. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies the licensee must justify the Frequencies as required by the staff Safety Evaluation Report (SER) for the topical report.
---

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains feedwater and main turbine high water level trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 2) assumption that 6 hours is the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the feedwater pump turbines and main turbine will trip when necessary.

SR 3.3.2.2.1

Performance of the CHANNEL CHECK once every 24 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels, or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limits.

INSERT 2

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with the channels required by the LCO.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on reliability analysis (Ref. 2).

SR 3.3.2.2.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

INSERT 2

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.2.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the feedwater and main turbine valves is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a valve is incapable of operating, the associated instrumentation would also be inoperable. The 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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. As required by Required Action D.1 and referenced in Table 3.3.3.1-1. | E.1 Be in MODE 3. | 12 hours |
| F. [ As required by Required Action D.1 and referenced in Table 3.3.3.1-1. | F.1 Initiate action in accordance with Specification 5.6.7. | Immediately ] |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
These SRs apply to each Function in Table 3.3.3.1-1.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.1.1 | Perform CHANNEL CHECK. | [31 days |
| SR 3.3.3.1.2 | Perform CHANNEL CALIBRATION. | [[18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1

This Required Action directs entry into the appropriate Condition referenced in Table 3.3.3.1-1. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met the Required Action of Condition C and the associated Completion Time has expired, Condition D is entered for that channel and provides for transfer to the appropriate subsequent Condition.

E.1

For the majority of Functions in Table 3.3.3.1-1, if the Required Action and associated Completion Time of Condition C is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. 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.

F.1

Since alternate means of monitoring primary containment area radiation have been developed and tested, the Required Action is not to shut down the plant, but rather to follow the directions of Specification 5.6.7. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. 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

The following SRs apply to each PAM instrumentation Function in Table 3.3.3.1-1.

SR 3.3.3.1.1

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 against a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter

BASES

SURVEILLANCE REQUIREMENTS (continued)

should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared to similar plant instruments located throughout the plant.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency of 31 days is based upon plant operating experience, with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of those displays associated with the required channels of this LCO.

INSERT 2

SR 3.3.3.1.2

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 the channel responds to measured parameter with the necessary range and accuracy.

The Frequency is based on operating experience and consistency with the typical industry refueling cycles.

REFERENCES

1. Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," [date].

2. [Plant specific documents (e.g., NRC Regulatory Guide 1.97, SER letter). ]

## 3.3 INSTRUMENTATION

### 3.3.3.2 Remote Shutdown System

LCO 3.3.3.2 The Remote Shutdown System Functions shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

----------NOTE----------
*Separate Condition entry is allowed for each Function.*
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required Functions inoperable. | A.1 Restore required Function to OPERABLE status. | 30 days |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.2.1 | [ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized. | [31 days ] |
| SR 3.3.3.2.2 | Verify each required control circuit and transfer switch is capable of performing the intended function. | [[18] months |
| SR 3.3.3.2.3 | Perform CHANNEL CALIBRATION for each required instrumentation channel. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.2.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies the channel responds to measured parameter values with the necessary range and accuracy.

INSERT 2

The 18 month Frequency is based upon operating experience and consistency with the typical industry refueling cycle.

REFERENCES 1. 10 CFR 50, Appendix A, GDC 19.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. One or more Functions with EOC-RPT trip capability not maintained.<br><br>AND<br><br>[ MCPR limit for inoperable EOC-RPT not made applicable. ] | B.1 Restore EOC-RPT trip capability.<br><br>OR<br><br>[ B.2 Apply the MCPR limit for inoperable EOC-RPT as specified in the COLR.] | 2 hours<br><br><br><br>[2 hours ] |
| C. Required Action and associated Completion Time not met. | C.1 ----------NOTE----------<br>Only applicable if inoperable channel is the result of an inoperable RPT breaker.<br>----------<br><br>Remove the affected recirculation pump from service.<br><br>OR<br><br>C.2 Reduce THERMAL POWER to < [30]% RTP. | <br><br><br><br>4 hours<br><br><br><br>4 hours |

SURVEILLANCE REQUIREMENTS

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

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.1.1 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.1.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers is included as a part of this test, overlapping the LOGIC SYSTEM FUNCTIONAL TEST, to provide complete testing of the associated safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) would also be inoperable.

The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.4.1.5

This SR ensures that an EOC-RPT initiated from the TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 30% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. Because main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from first stage pressure) the main turbine bypass valves must remain closed at THERMAL POWER ≥ 30% RTP to ensure that the calibration remains valid. If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 30% RTP, either due to open main turbine bypass valves or other reasons), the affected TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met with the channel considered OPERABLE.

INSERT 2

The Frequency of 18 months has shown that channel bypass failures between successive tests are rare.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.1.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The EOC-RPT SYSTEM RESPONSE TIME acceptance criteria are included in Reference 6.

A Note to the Surveillance states that breaker interruption time may be assumed from the most recent performance of SR 3.3.4.1.7. This is allowed since the time to open the contacts after energization of the trip coil and the arc suppression time are short and do not appreciably change, due to the design of the breaker opening device and the fact that the breaker is not routinely cycled.

EOC-RPT SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Response times cannot be determined at power because operation of final actuated devices is required. Therefore, the 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components that cause serious response time degradation, but not channel failure, are infrequent occurrences.

INSERT 2

SR 3.3.4.1.7

This SR ensures that the RPT breaker interruption time (arc suppression time plus time to open the contacts) is provided to the EOC-RPT SYSTEM RESPONSE TIME test. The 60 month Frequency of the testing is based on the difficulty of performing the test and the reliability of the circuit breakers.

REFERENCES

1. FSAR, Figure [ ] (EOC-RPT logic diagram).
2. FSAR, Section [5.2.2].
3. FSAR, Sections [15.1.1, 15.1.2, and 15.1.3].
4. FSAR, Sections [5.5.16.1 and 7.6.10].
5. GENE-770-06-1, "Bases For Changes To Surveillance Test Intervals And Allowed Out-Of-Service Times For Selected Instrumentation Technical Specifications," February 1991.
6. FSAR, Section [5.5.16.2].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Both Functions with ATWS-RPT trip capability not maintained. | C.1 Restore ATWS-RPT trip capability for one Function. | 1 hour |
| D. Required Action and associated Completion Time not met. | D.1 ----------NOTE---------- Only applicable if inoperable channel is the result of an inoperable RPT breaker. ---------- Remove the affected recirculation pump from service. | 6 hours |
| | OR | |
| | D.2 Be in MODE 2. | 6 hours |

SURVEILLANCE REQUIREMENTS

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

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.2.1 | [ Perform CHANNEL CHECK. | [12 hours ] |
| SR 3.3.4.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.4.2.3 | [ Calibrate the trip units. | [92] days ] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.2.4 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br>a. Reactor Vessel Water Level - Low Low, Level 2: ≥ [-47] inches and<br>b. Reactor Steam Dome Pressure - High: ≤ [1095] psig. | [18] months |
| SR 3.3.4.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the required channels of this LCO.

INSERT 2

SR 3.3.4.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.3

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in SR 3.3.4.2.4. If the trip setting is discovered to be less conservative than the setting accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 2.

SR 3.3.4.2.4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

INSERT 2

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.4.2.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) would be inoperable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. INSERT 2

REFERENCES

1. FSAR, Figure [ ] ATWS-RPT Logic Diagram.
2. GEDE-770-06-1, "Bases for Changes To Surveillance Test Intervals and Allowed Out-of-Service Times For Selected Instrumentation Technical Specifications," February 1991.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| H. Required Action and associated Completion Time of Condition B, C, D, E, F, or G not met. | H.1 Declare associated supported feature(s) inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.5.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.5.1.3 | [ Calibrate the trip unit. | [92] days ] |
| SR 3.3.5.1.4 | [ Perform CHANNEL CALIBRATION. | 92 days ] |
| SR 3.3.5.1.5 | Perform CHANNEL CALIBRATION. | [18] months |
| SR 3.3.5.1.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [18] months |
| SR 3.3.5.1.7 | Verify the ECCS RESPONSE TIME is within limits. | [18] months on a STAGGERED TEST BASIS |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 5) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary.

SR 3.3.5.1.1

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 instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK guarantees that undetected outright channel failure is limited to 12 hours; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

Insert 2

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.5.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of Reference 5.

SR 3.3.5.1.3

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.5.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analyses. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than the setting accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 5.

INSERT 2

SR 3.3.5.1.4 and SR 3.3.5.1.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.5.1.4 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.5.1.5 is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.1, LCO 3.5.2, LCO 3.8.1, and LCO 3.8.2 overlaps this Surveillance to complete testing of the assumed safety function.

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.5.1.7

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Reference 4.

INSERT 2

ECCS RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

----------REVIEWER'S NOTE----------
[The following Bases are applicable for plants adopting NEDO-32291-A.
---

However, the measurement of instrument loop response times may be excluded if the conditions of Reference 6 are satisfied.]

ECCS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1. | D.1 ----------NOTE---------- Only applicable if RCIC pump suction is not aligned to the suppression pool. ---------- Declare RCIC System inoperable. | 1 hour from discovery of loss of RCIC initiation capability |
| | AND | |
| | D.2.1 Place channel in trip. | 24 hours |
| | OR | |
| | D.2.2 Align RCIC pump suction to the suppression pool. | 24 hours |
| E. Required Action and associated Completion Time of Condition B, C, or D not met. | E.1 Declare RCIC System inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 5; and (b) for up to 6 hours for Functions 1, 3, and 4 provided the associated Function maintains RCIC initiation capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.2.1 | Perform CHANNEL CHECK. | 12 hours |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.5.2.3 | [ Calibrate the trip units. | [[92] days ] |
| SR 3.3.5.2.4 | [ Perform CHANNEL CALIBRATION. | [92 days ] |
| SR 3.3.5.2.5 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.5.2.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted in the beginning of the SRs, the SRs for each RCIC System instrumentation Function are found in the SRs column of Table 3.3.5.2-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 5; and (b) for up to 6 hours for Functions 1, 3, and 4, provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RCIC will initiate when necessary.

SR 3.3.5.2.1

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 parameter on other similar channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 1.

INSERT 2

SR 3.3.5.2.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.5.2-1. If the trip setting is discovered to be less conservative than the setting accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 1.

SR 3.3.5.2.4 and SR 3.3.5.2.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of SR 3.3.5.2.4 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

The Frequency of SR 3.3.5.2.5 is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.5.2.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.3 overlaps this Surveillance to provide complete testing of the safety function.

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. NEDE-770-06-2, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. | I.1 Declare associated standby liquid control subsystem (SLC) inoperable. | 1 hour |
| | OR | |
| | I.2 Isolate the Reactor Water Cleanup System. | 1 hour |
| J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. | J.1 Initiate action to restore channel to OPERABLE status. | Immediately |
| | OR | |
| | J.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling System. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.1.3 | [ Calibrate the trip unit. | [92] days ] |
| SR 3.3.6.1.4 | Perform CHANNEL CALIBRATION. | 92 days |
| SR 3.3.6.1.5 | [ Perform CHANNEL FUNCTIONAL TEST. | [184] days ] |
| SR 3.3.6.1.6 | Perform CHANNEL CALIBRATION. | [18] months |
| SR 3.3.6.1.7 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [18] months |
| ----------REVIEWER'S NOTE---------- This SR is applied only to Functions of Table 3.3.6.1-1 with required response times not corresponding to DG start time. ---------- | | |
| SR 3.3.6.1.8 | ----------NOTE---------- [ Radiation detectors may be excluded. ] ---------- | |
| | Verify the ISOLATION SYSTEM RESPONSE TIME is within limits. | [18] months on a STAGGERED TEST BASIS |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each Primary Containment Isolation instrumentation Function are found in the SRs column of Table 3.3.6.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the PCIVs will isolate the penetration flow path(s) when necessary.

SR 3.3.6.1.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

Insert 2

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.2 and SR 3.3.6.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The 92 day Frequency of SR 3.3.6.1.2 is based on the reliability analysis described in References 6 and 7. The 184 day Frequency of SR 3.3.6.1.5 is based on engineering judgment and the reliability of the components (time delay relays exhibit minimal drift).

SR 3.3.6.1.3

Insert 2

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than that accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of References 5 and 6.

SR 3.3.6.1.4 and SR 3.3.6.1.6

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of SR 3.3.6.1.4 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.6.1.6 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.6.1.7

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on PCIVs in LCO 3.6.1.3 overlaps this Surveillance to provide complete testing of the assumed safety function. The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

INSERT 2

SR 3.3.6.1.8

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the PCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME.

ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7. ISOLATION SYSTEM RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

----------REVIEWER'S NOTE----------

[The following Bases are applicable for plants adopting NEDO-32291-A and/or Supplement 1.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

However, the sensors for Functions 1.a, 1.b, and 1.c are allowed to be excluded from specific ISOLATION SYSTEM RESPONSE TIME measurement if the conditions of Reference 8 are satisfied. If these conditions are satisfied, sensor response time may be allocated based on either assumed design sensor response time or the manufacturer's stated design response time. When the requirements of Reference 8 are not satisfied, sensor response time must be measured. Furthermore, measurement of the instrument loops response time for Functions 1.a, 1.b, and 1.c is not required if the conditions of Reference 9 are satisfied. For all other Functions, the measurement of instrument loop response times may be excluded if the conditions of Reference 8 are satisfied.]

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response times for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.

INSERT 2

[ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.

4. FSAR, Section [4.2.3.4.3].

5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2.1 Place the associated standby gas treatment (SGT) subsystem(s) in operation. | 1 hour |
| | OR | |
| | C.2.2 Declare associated SGT subsystem(s) inoperable. | 1 hour |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.2.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.6.2.3 | [ Calibrate the trip unit. | [[92] days] |
| SR 3.3.6.2.4 | [ Perform CHANNEL CALIBRATION. | [92 days ] |
| SR 3.3.6.2.5 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.6.2.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| ----------REVIEWER'S NOTE---------- This SR is applied only to Functions of Table 3.3.6.2-1 with required response times not corresponding to DG start time. ---------- | | |
| SR 3.3.6.2.7 | ----------NOTE---------- [ Radiation detectors may be excluded. ] ---------- | |
| | Verify the ISOLATION SYSTEM RESPONSE TIME is within limits. | [[18] months on a STAGGERED TEST BASIS INSERT 1 |

BASES

ACTIONS (continued)

Alternately, declaring the associated SCIVs or SGT subsystem(s) inoperable (Required Actions C.1.2 and C.2.2) is also acceptable since the Required Actions of the respective LCOs (LCO 3.6.4.2 and LCO 3.6.4.3) provide appropriate actions for the inoperable components.

One hour is sufficient for plant operations personnel to establish required plant conditions or to declare the associated components inoperable without unnecessarily challenging plant systems.

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each Secondary Containment Isolation instrumentation Function are located in the SRs column of Table 3.3.6.2-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains secondary containment isolation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated the 6 hour testing allowance does not significantly reduce the probability that the SCIVs will isolate the associated penetration flow paths and that the SGT System will initiate when necessary.

SR 3.3.6.2.1

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with channels required by the LCO.

INSERT 2

SR 3.3.6.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of References 5 and 6.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.3

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.2-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of References 5 and 6.

SR 3.3.6.2.4 and SR 3.3.6.2.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

INSERT 2

The Frequencies of SR 3.3.6.2.4 and SR 3.3.6.2.5 are based on the assumption of a 92 day and an 18 month calibration interval, respectively, in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.6.2.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on SCIVs and the SGT System in LCO 3.6.4.2 and LCO 3.6.4.3, respectively, overlaps this Surveillance to provide complete testing of the assumed safety function.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Insert 2

SR 3.3.6.2.7

This SR ensures that the individual channel response times are less than or equal to the maximum value assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the SCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7.

ISOLATION SYSTEM RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

----------REVIEWER'S NOTE----------
[The following Bases are applicable for plants adopting NEDO-32291-A.
---

However, the measurement of instrument loop response times may be excluded if the conditions of Reference 8 are satisfied.]

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based on plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

INSERT 2

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. FSAR, Section [15.1.40].

4. FSAR, Sections [15.1.39 and 15.1.41].

5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

7. FSAR, Section [7.3].

[8. NEDO-32291-A, "System Analyses for the Elimination of Selected Response Time Testing Requirements," October 1995.]

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Required Action and associated Completion Time of Condition A, B, or C not met.<br><br>OR<br><br>Two or more LLS valves inoperable due to inoperable channels. | D.1 Declare the associated LLS valve(s) inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.6.3-1 to determine which SRs apply for each Function.

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.3.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.3.2 | Perform CHANNEL FUNCTIONAL TEST for portion of the channel outside primary containment. | [92] days |
| SR 3.3.6.3.3 | ----------NOTE----------<br>Only required to be performed prior to entering MODE 2 during each scheduled outage > 72 hours when entry is made into primary containment.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST for portions of the channel inside primary containment. | [92] days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.3.4 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.6.3.5 | [ Calibrate the trip unit. | [92] days ] |
| SR 3.3.6.3.6 | Perform CHANNEL CALIBRATION. | [18] months |
| SR 3.3.6.3.7 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use the Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each LLS instrumentation Function are located in the SRs column of Table 3.3.6.3-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains LLS initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the LLS valves will initiate when necessary.

SR 3.3.6.3.1

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 another channel. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with channels required by the LCO.

SR 3.3.6.3.2, SR 3.3.6.3.3, and SR 3.3.6.3.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

INSERT 2

The 92 day Frequency is based on the reliability analysis of Reference 3.

A portion of the S/RV tailpipe pressure switch instrument channels are located inside the primary containment. The Note for SR 3.3.6.3.3, "Only required to be performed prior to entering MODE 2 during each scheduled outage > 72 hours when entry is made into primary containment," is based on the location of these instruments, ALARA considerations, and compatibility with the Completion Time of the associated Required Action (Required Action B.1).

SR 3.3.6.3.5

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than the setting accounted for in the appropriate setpoint methodology. The Frequency of every 92 days for SR 3.3.6.3.5 is based on the reliability analysis of Reference 3.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.3.6

CHANNEL CALIBRATION is a complete check of the instrument loop and sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of once every 18 months for SR 3.3.6.3.6 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.6.3.7

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specified channel. The system functional testing performed in LCO 3.4.3, "Safety/Relief Valves(S/RVs)" and LCO 3.6.1.8, "Low-Low Set (LLS) Safety/Relief Valves (S/RVs)," for S/RVs overlaps this test to provide complete testing of the assumed safety function.

The Frequency of once every 18 months for SR 3.3.6.3.7 is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Figure [ ].

2. FSAR, Section [5.5.17].

3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each [MCREC] Function.

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.7.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.7.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.7.1.3 | [ Calibrate the trip units. | [[92] days ] |
| SR 3.3.7.1.4 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.7.1.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each MCREC System instrumentation Function are located in the SRs column of Table 3.3.7.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains MCREC System initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the MCREC System will initiate when necessary.

SR 3.3.7.1.1

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

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with channels required by the LCO.

SR 3.3.7.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

INSERT 2

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of References 5 and 6.

SR 3.3.7.1.3

The calibration of trip units provides a check of the actual trip setpoints. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.7.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than the setting accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of References 5 and 6.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.7.1.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.7.4, "Main Control Room Environmental Control (MCREC) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Figure [ ].
2. FSAR, Section [6.4.1].
3. FSAR, Section [6.4.1.7.2].
4. FSAR, Table [15.1.28].
5. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.
6. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

## 3.3 INSTRUMENTATION

### 3.3.8.1 Loss of Power (LOP) Instrumentation

LCO 3.3.8.1 The LOP instrumentation for each Function in Table 3.3.8.1-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
When the associated diesel generator is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more channels inoperable. | A.1 Place channel in trip. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 Declare associated diesel generator (DG) inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------
1. Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains DG initiation capability.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.1.1 | [ Perform CHANNEL CHECK. | [12 hours] Insert 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [31 days |
| SR 3.3.8.1.3 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.8.1.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each LOP instrumentation Function are located in the SRs column of Table 3.3.8.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains DG initiation capability. Upon completion of the Surveillance, or expiration of the 2 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken.

SR 3.3.8.1.1

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

INSERT 2

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with channels required by the LCO.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 31 days is based on operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is a rare event.

SR 3.3.8.1.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

INSERT 2

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.8.1.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed in LCO 3.8.1 and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety functions.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

INSERT 2

REFERENCES

1. FSAR, Figure [ ].
2. FSAR, Section [5.2].
3. FSAR, Section [6.3].
4. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | D.2.1 [ Initiate action to restore one electric power monitoring assembly to OPERABLE status for inservice power supply(s) supplying required instrumentation. | Immediately ] |
| | OR | |
| | D.2.2 [ Initiate action to isolate the Residual Heat Removal Shutdown Cooling System. | Immediately ] |

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.3.8.2.1 | ----------NOTE---------- Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours. ---------- | |
| | Perform CHANNEL FUNCTIONAL TEST. | [184 days |
| SR 3.3.8.2.2 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br>a. Overvoltage ≤ [132] V.<br>b. Undervoltage ≥ [108] V, with time delay set to [zero].<br>c. Underfrequency ≥ [57] Hz, with time delay set to [zero]. | [[18] months |
| SR 3.3.8.2.3 | Perform a system functional test. | [[18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1, D.2.1, and D.2.2

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 4 or 5, or with any control rod withdrawn from a core cell containing one or more fuel assemblies or with both RHR shutdown cooling valves open, the operator must immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Required Action D.1 results in the least reactive condition for the reactor core and ensures that the safety function of the RPS (e.g., scram of control rods) is not required.

In addition, action must be immediately initiated to either restore one electric power monitoring assembly to OPERABLE status for the inservice power source supplying the required instrumentation powered from the RPS bus (Required Action D.2.1) or to isolate the RHR Shutdown Cooling System (Required Action D.2.2). Required Action D.2.1 is provided because the RHR Shutdown Cooling System may be needed to provide core cooling. All actions must continue until the applicable Required Actions are completed.

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.1

A CHANNEL FUNCTIONAL TEST is performed on each overvoltage, undervoltage, and underfrequency channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

As noted in the Surveillance, the CHANNEL FUNCTIONAL TEST is only required to be performed while the plant is in a condition in which the loss of the RPS bus will not jeopardize steady state power operation (the design of the system is such that the power source must be removed from service to conduct the Surveillance). The 24 hours is intended to indicate an outage of sufficient duration to allow for scheduling and proper performance of the Surveillance.

The 184 day Frequency and the Note in the Surveillance are based on guidance provided in Generic Letter 91-09 (Ref. 2).

[The 184 day Frequency is based on Reference 2.

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.2.2

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

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

SR 3.3.8.2.3

Performance of a system functional test demonstrates that, with a required system actuation (simulated or actual) signal, the logic of the system will automatically trip open the associated power monitoring assembly. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E circuit breakers is included as part of this test to provide complete testing of the safety function. If the breakers are incapable of operating, the associated electric power monitoring assembly would be inoperable.

INSERT 2

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Section [8.3.1.1.4.B].

2. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electrical Protective Assemblies in Power Supplies for the Reactor Protection System."

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Required Action and associated Completion Time of Condition A not met.<br><br>OR<br><br>No recirculation loops in operation. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

The mismatch is measured in terms of percent of rated core flow. If the flow mismatch exceeds the specified limits, the loop with the lower flow is considered inoperable. The SR is not required when both loops are not in operation since the mismatch limits are meaningless during single loop or natural circulation operation. The Surveillance must be performed within 24 hours after both loops are in operation. [The 24 hour Frequency is consistent with the Surveillance Frequency for jet pump OPERABILITY verification and has been shown by operating experience to be adequate to detect off normal jet pump loop flows in a timely manner.

INSERT 2

REFERENCES

1. FSAR, Section [6.3.3.4].
2. FSAR, Section [5.5.1.4].
3. [ Plant specific analysis for single loop operation. ]

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.2.1 | ----------NOTES----------<br>1. Not required to be performed until 4 hours after associated recirculation loop is in operation.<br><br>2. Not required to be performed until 24 hours after > 25% RTP.<br>----------<br><br>Verify at least one of the following criteria (a, b, or c) is satisfied for each operating recirculation loop:<br><br>a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns.<br><br>b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns.<br><br>c. Each jet pump flow differs by ≤ 10% from established patterns. | 24 hours INSERT 1 |

----------REVIEWER'S NOTE----------
An acceptable option to these criteria for jet pump OPERABILITY can be found in the BWR/6 STS, NUREG-1434.
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BASES

SURVEILLANCE REQUIREMENTS (continued)

satisfy one of the performance criteria provided. Since refueling activities (fuel assembly replacement or shuffle, as well as any modifications to fuel support orifice size or core plate bypass flow) can affect the relationship between core flow, jet pump flow, and recirculation loop flow, these relationships may need to be re-established each cycle. Similarly, initial entry into extended single loop operation may also require establishment of these relationships. During the initial weeks of operation under such conditions, while base-lining new "established patterns", engineering judgement of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.

The recirculation pump speed operating characteristics (pump flow and loop flow versus pump speed) are determined by the flow resistance from the loop suction through the jet pump nozzles. A change in the relationship indicates a plug, flow restriction, loss in pump hydraulic performance, leakage, or new flow path between the recirculation pump discharge and jet pump nozzle. For this criterion, the pump flow and loop flow versus pump speed relationship must be verified.

Individual jet pumps in a recirculation loop normally do not have the same flow. The unequal flow is due to the drive flow manifold, which does not distribute flow equally to all risers. The flow (or jet pump diffuser to lower plenum differential pressure) pattern or relationship of one jet pump to the loop average is repeatable. An appreciable change in this relationship is an indication that increased (or reduced) resistance has occurred in one of the jet pumps. This may be indicated by an increase in the relative flow for a jet pump that has experienced beam cracks.

The deviations from normal are considered indicative of a potential problem in the recirculation drive flow or jet pump system (Ref. 2). Normal flow ranges and established jet pump flow and differential pressure patterns are established by plotting historical data as discussed in Reference 2.

INSERT 2

The 24 hour Frequency has been shown by operating experience to be timely for detecting jet pump degradation and is consistent with the Surveillance Frequency for recirculation loop OPERABILITY verification.

This SR is modified by two Notes. Note 1 allows this Surveillance not to be performed until 4 hours after the associated recirculation loop is in operation, since these checks can only be performed during jet pump operation. The 4 hours is an acceptable time to establish conditions appropriate for data collection and evaluation.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.3.1 | ----------NOTE----------<br>≤ [2] [required] S/RVs may be changed to a lower setpoint group.<br>----------<br><br>Verify the safety function lift setpoints of the [required] S/RVs are as follows:<br><br>Number of S/RVs — Setpoint (psig)<br>[4] — [1090 ± 32.7]<br>[4] — [1100 ± 33.0]<br>[3] — [1110 ± 33.3]<br><br>Following testing, lift settings shall be within ± 1%. | [In accordance with the Inservice Testing Program or [18] months]<br>Insert 1 |
| SR 3.4.3.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each [required] S/RV opens when manually actuated. | [18] months [on a STAGGERED TEST BASIS for each valve solenoid]<br>Insert 1 |

BASES

ACTIONS (continued)

The 14 day Completion Time to restore the inoperable required S/RVs to OPERABLE status is based on the relief capability of the remaining S/RVs, the low probability of an event requiring S/RV actuation, and a reasonable time to complete the Required Action. ]

B.1 and B.2

With less than the minimum number of required S/RVs OPERABLE, a transient may result in the violation of the ASME Code limit on reactor pressure. If the safety function of the inoperable required S/RVs cannot be restored to OPERABLE status within the associated Completion Time of Required Action A.1, or if the safety function of [three] or more [required] S/RVs is inoperable, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

This Surveillance requires that the [required] S/RVs will open at the pressures assumed in the safety analysis of Reference 1. The demonstration of the S/RV safe lift settings must be performed during shutdown, since this is a bench test, [to be done in accordance with the Inservice Testing Program]. The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures. The S/RV setpoint is ± [3]% for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. [A Note is provided to allow up to [two] of the required [11] S/RVs to be physically replaced with S/RVs with lower setpoints. This provides operational flexibility which maintains the assumptions in the over-pressure analysis.]

The 18 month Frequency was selected because this Surveillance must be performed during shutdown conditions and is based on the time between refuelings.

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.3.2

A manual actuation of each [required] S/RV is performed to verify that, mechanically, the valve is functioning properly and no blockage exists in the valve discharge line. This can be demonstrated by the response of the turbine control valves or bypass valves, by a change in the measured steam flow, or by any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the S/RVs divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this test. Adequate pressure at which this test is to be performed is [920] psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow $\geq 10^6$ lb/hr]. Plant startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME Code requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed for manual actuation after the required pressure is reached is sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR. If a valve fails to actuate due only to the failure of the solenoid but is capable of opening on overpressure, the safety function of the S/RV is considered OPERABLE.

INSERT 2

The [18] month on a STAGGERED TEST BASIS Frequency ensures that each solenoid for each S/RV is alternately tested. The 18 month Frequency was developed based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 3). Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [5.2.2.2.4].

2. FSAR, Section [15].

3. ASME, Boiler and Pressure Vessel Code, Section XI.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time of Condition A or B not met.<br><br>OR<br><br>Pressure boundary LEAKAGE exists. | C.1 Be in MODE 3.<br><br>AND<br><br>C.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.4.1 | Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits. | ≤ 8 hours INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS (continued)

determine actual LEAKAGE rates; however, any method may be used to quantify LEAKAGE within the guidelines of Reference 5. In conjunction with alarms and other administrative controls, an 8 hour Frequency for this Surveillance is appropriate for identifying LEAKAGE and for tracking required trends (Ref. 6). Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. GEAP-5620, April 1968.
3. NUREG-76/067, October 1975.
4. FSAR, Section [5.2.7.5.2].
5. Regulatory Guide 1.45.
6. Generic Letter 88-01, Supplement 1.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2 Isolate the high pressure portion of the affected system from the low pressure portion by use of a second closed manual, de-activated automatic, or check valve. | 72 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.5.1 | ----------NOTE----------<br>Not required to be performed in MODE 3.<br>----------<br><br>Verify equivalent leakage of each RCS PIV is ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm, at an RCS pressure ≥ [ ] and ≤ [ ] psig. | [In accordance with the Inservice Testing Program or [18] months] |

Insert 1

BASES

ACTIONS (continued)

B.1 and B.2

If leakage cannot be reduced or the system isolated, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and MODE 4 within 36 hours. This action may reduce the leakage and also reduces the potential for a LOCA outside the containment. The Completion Times are reasonable, based on operating experience, to achieve the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

Performance of leakage testing on each RCS PIV 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. 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.

The 18 month Frequency required by the Inservice Testing Program is within the ASME Code, Section XI, Frequency requirement and is based on the need to perform this Surveillance during an outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Insert 2

This SR is modified by a Note that states the leakage Surveillance is not required to be performed in MODE 3. Entry into MODE 3 is permitted for leakage testing at high differential pressures with stable conditions not possible in the lower MODES.

REFERENCES

1. 10 CFR 50.2.
2. 10 CFR 50.55a(c).
3. 10 CFR 50, Appendix A, GDC 55.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.6.1 | Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system. | [12 hours |
| SR 3.4.6.2 | Perform a CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation. | [31 days |
| SR 3.4.6.3 | Perform a CHANNEL CALIBRATION of required leakage detection instrumentation. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This SR is for the performance of a CHANNEL CHECK of the required primary containment atmospheric monitoring system. The check gives reasonable confidence that the channel is operating properly. The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.

SR 3.4.6.2

This SR is for the performance of a CHANNEL FUNCTIONAL TEST of the required RCS leakage detection instrumentation. The test ensures that the monitors can perform their function in the desired manner. The test also verifies the alarm setpoint and relative accuracy of the instrument string. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Frequency of 31 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.

INSERT 2

SR 3.4.6.3

This SR is for the performance of a CHANNEL CALIBRATION of required 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. Operating experience has proven this Frequency is acceptable.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. Regulatory Guide 1.45, May 1973.
3. FSAR, Section [5.2.7.2.1].
4. GEAP-5620, April 1968.
5. NUREG-75/067, October 1975.
6. FSAR, Section [5.2.7.5.2].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.7.1 | ----------NOTE----------<br>Only required to be performed in MODE 1.<br>----------<br><br>Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ [0.2] µCi/gm. | [7 days Insert 1 |

BASES

ACTIONS (continued)

Alternatively, the plant can be placed in MODE 3 within 12 hours and in MODE 4 within 36 hours. This option is provided for those instances when isolation of main steam lines is not desired (e.g., due to the decay heat loads). In MODE 4, the requirements of the LCO are no longer applicable.

The Completion Time of once every 4 hours is the time needed to take and analyze a sample. The 12 hour Completion Time is reasonable, based on operating experience, to isolate the main steam lines in an orderly manner and without challenging plant systems. Also, the allowed Completion Times for Required Actions B.2.2.1 and B.2.2.2 for placing the unit in MODES 3 and 4 are reasonable, based on operating experience, to achieve the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This Surveillance is performed to ensure iodine remains within limit during normal operation. The 7 day Frequency is adequate to trend changes in the iodine activity level. INSERT 2

This SR is modified by a Note that requires this Surveillance to be performed only in MODE 1 because the level of fission products generated in other MODES is much less.

REFERENCES

1. 10 CFR 100.11, 1973.

2. FSAR, Section [15.1.40].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.3 Be in MODE 4. | 24 hours |
| B. No RHR shutdown cooling subsystem in operation.<br><br>AND<br><br>No recirculation pump in operation. | B.1 Initiate action to restore one RHR shutdown cooling subsystem or one recirculation pump to operation. | Immediately |
| | AND | |
| | B.2 Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br><br>AND<br><br>Once per 12 hours thereafter |
| | AND | |
| | B.3 Monitor reactor coolant temperature and pressure. | Once per hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.8.1 | ----------NOTE----------<br>Not required to be met until 2 hours after reactor steam dome pressure is < [the RHR cut in permissive pressure].<br>----------<br><br>Verify one RHR shutdown cooling subsystem or recirculation pump is operating. | [12 hours INSERT 1 |

BASES

ACTIONS (continued)

B.1, B.2, and B.3

With no RHR shutdown cooling subsystem and no recirculation pump in operation, except as permitted by LCO Note 1, reactor coolant circulation by the RHR shutdown cooling subsystem or recirculation pump must be restored without delay.

Until RHR or recirculation pump operation is re-established, an alternate method of reactor coolant circulation must be placed into service. This will provide the necessary circulation for monitoring coolant temperature. The 1 hour Completion Time is based on the coolant circulation function and is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation. Furthermore, verification of the functioning of the alternate method must be reconfirmed every 12 hours thereafter. This will provide assurance of continued temperature monitoring capability.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR shutdown cooling subsystem or recirculation pump), the reactor coolant temperature and pressure must be periodically monitored to ensure proper function of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room.

Insert 2

This Surveillance is modified by a Note allowing sufficient time to align the RHR System for shutdown cooling operation after clearing the pressure interlock that isolates the system, or for placing a recirculation pump in operation. The Note takes exception to the requirements of the Surveillance being met (i.e., forced coolant circulation is not required for this initial 2 hour period), which also allows entry into the Applicability of this Specification in accordance with SR 3.0.4 since the Surveillance will not be "not met" at the time of entry into the Applicability.

REFERENCES None.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.2 Monitor reactor coolant temperature. | Once per hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.9.1 | Verify one RHR shutdown cooling subsystem or recirculation pump is operating. | [12 hours INSERT 1 |

BASES

ACTIONS (continued)

B.1 and B.2

With no RHR shutdown cooling subsystem and no recirculation pump in operation, except as permitted by LCO Note 1, and until RHR or recirculation pump operation is re-established, an alternate method of reactor coolant circulation must be placed into service. This will provide the necessary circulation for monitoring coolant temperature. The 1 hour Completion Time is based on the coolant circulation function and is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation. Furthermore, verification of the functioning of the alternate method must be reconfirmed every 12 hours thereafter. This will provide assurance of continued temperature monitoring capability.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR Shutdown Cooling System or recirculation pump), the reactor coolant temperature and pressure must be periodically monitored to ensure proper function of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room.

INSERT 2

REFERENCES None.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.10.1 | ----------NOTE----------<br>Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing.<br>----------<br><br>Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR. | [30 minutes Insert 1 |
| SR 3.4.10.2 | Verify RCS pressure and RCS temperature are within the criticality limits specified in the PTLR. | Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality |
| SR 3.4.10.3 | ----------NOTE----------<br>Only required to be met in MODES 1, 2, 3, and 4 during recirculation pump startup [with reactor steam dome pressure ≥ 25 psig].<br>----------<br><br>Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is within the limits specified in the PTLR. | Once within 15 minutes prior to each startup of a recirculation pump |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.10.7 | ----------NOTE----------<br>Only required to be performed when tensioning the reactor vessel head bolting studs.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR. | 30 minutes |
| SR 3.4.10.8 | ----------NOTE----------<br>Not required to be performed until 30 minutes after RCS temperature ≤ 80°F in MODE 4.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR. | Insert 1<br><br>30 minutes |
| SR 3.4.10.9 | ----------NOTE----------<br>Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR. | 12 hours |

BASES

ACTIONS (continued)

B.1 and B.2

If a Required Action and associated Completion Time of Condition A are not met, the plant must be placed in a lower MODE because either the RCS remained in an unacceptable P/T region for an extended period of increased stress, or a sufficiently severe event caused entry into an unacceptable region. Either possibility indicates a need for more careful examination of the event, best accomplished with the RCS at reduced pressure and temperature. With the reduced pressure and temperature conditions, the possibility of propagation of undetected flaws is decreased.

Pressure and temperature are reduced by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

Operation outside the P/T limits in other than MODES 1, 2, and 3 (including defueled conditions) must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses. The Required Action must be initiated without delay and continued until the limits are restored.

Besides restoring the P/T limit parameters to within limits, an evaluation is required to determine if RCS operation is allowed. This evaluation must verify that the RCPB integrity is acceptable and must be completed before approaching criticality or heating up to > 200°F. Several methods may be used, including comparison with pre-analyzed transients, new analyses, or inspection of the components. ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1

Verification that operation is within 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 a reasonable time for assessment and correction of minor deviations.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

Performing the Surveillance within 15 minutes before starting the idle recirculation pump, THERMAL POWER increase during single loop operation, or recirculation flow increase during single loop operation, provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the idle pump start, power increase, or flow increase. ]

An acceptable means of demonstrating compliance with the temperature differential requirement in SR 3.4.10.4 [and SR 3.4.10.6] is to compare the temperatures of the operating recirculation loop and the idle loop.

[SR 3.4.10.3] [These SRs have] have been modified by [a Note] [Notes] that require[s] the Surveillance to be performed only in [MODES 1, 2, 3, and 4 [with reactor steam dome pressure ≥ 25 psig.] [Certain MODES] In MODE 5, the overall stress on limiting components is lower. Therefore, ΔT limits are not required for SRs 3.4.10.3 and 3.4.10.4 in MODE 5. [In MODES 3, 4, and 5, THERMAL POWER increases are not possible and recirculation flow increases will not result in additional stresses. Therefore, ΔT limits are only required for SRs 3.4.10.5 and 3.4.10.6. The Notes also state that the SR is only required to be met during the event of concern (e.g., pump startup, power increase, or flow increase) since this is when the stresses occur[]]. The Note also states the SR is only required to be met during a recirculation pump startup, since this is when the stresses occur.

SR 3.4.10.7, SR 3.4.10.8, and SR 3.4.10.9

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

The flange temperatures must be verified to be above the limits 30 minutes before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. When in MODE 4 with RCS temperature ≤ 80°F, 30 minute checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 100°F, monitoring of the flange temperature is required every 12 hours to ensure the temperature is within the limits specified in the PTLR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

INSERT 2

[The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

REFERENCES

1. 10 CFR 50, Appendix G.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
3. ASTM E 185-82, July 1982.
4. 10 CFR 50, Appendix H.
5. Regulatory Guide 1.99, Revision 2, May 1988.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. NEDO-21778-A, December 1978.
[ 8. FSAR, Section [15.1.26]. ]

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.11 Reactor Steam Dome Pressure

LCO 3.4.11 The reactor steam dome pressure shall be ≤ [1020] psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Reactor steam dome pressure not within limit. | A.1 Restore reactor steam dome pressure to within limit. | 15 minutes |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.11.1 | Verify reactor steam dome pressure is ≤ [1020] psig. | [12 hours |

INSERT 1

BASES

ACTIONS

A.1

With the reactor steam dome pressure greater than the limit, prompt action should be taken to reduce pressure to below the limit and return the reactor to operation within the bounds of the analyses. The 15 minute Completion Time is reasonable considering the importance of maintaining the pressure within limits. This Completion Time also ensures that the probability of an accident occurring while pressure is greater than the limit is minimized. If the operator is unable to restore the reactor steam dome pressure to below the limit, then the reactor should be placed in MODE 3 to be operating within the assumptions of the transient analyses.

B.1

If the reactor steam dome pressure cannot be restored to within the limit within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

INSERT 2

Verification that reactor steam dome pressure is ≤ [1020] psig ensures that the initial conditions of the design basis accidents and transients are met. Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.

REFERENCES

1. FSAR, Section [5.2.2.2.4].
2. FSAR, Section [15].

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.5.1.1 | Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve. | [31 days |
| SR 3.5.1.2 | Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.5.1.3 | Verify ADS [air supply header] pressure is ≥ [90] psig. | [31 days |
| SR 3.5.1.4 | [ Verify the [RHR] System cross tie valve[s] [is] closed and power is removed from the valve operator[s]. | [31 days ] |
| SR 3.5.1.5 | [ Verify each LPCI inverter output voltage is ≥ [570] V and ≤ [630] V while supplying the respective bus. | [31 days ] |
| SR 3.5.1.6 | ----------NOTE---------- Not required to be performed if performed within the previous 31 days. ---------- | |
| | Verify each recirculation pump discharge valve [and bypass valve] cycles through one complete cycle of full travel [or is de-energized in the closed position]. | Once each startup prior to exceeding 25% RTP |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.7 | Verify the following ECCS pumps develop the specified flow rate [against a system head corresponding to the specified reactor pressure].<br><br>System / Flow Rate / No. of Pumps / [System Head Corresponding to a Reactor Pressure of]<br><br>Core Spray: ≥ [4250] gpm, [1], ≥ [113] psig<br>LPCI: ≥ [17,000] gpm, [2], ≥ [20] psig | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.5.1.8 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify, with [reactor pressure] ≤ [1020] and ≥ [920] psig, the HPCI pump can develop a flow rate ≥ [4250] gpm [against a system head corresponding to reactor pressure]. | [92 days |
| SR 3.5.1.9 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify, with [reactor pressure] ≤ [165] psig, the HPCI pump can develop a flow rate ≥ [4250] gpm [against a system head corresponding to reactor pressure]. | [18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.10 | ----------NOTE----------<br>Vessel injection/spray may be excluded.<br>----------<br><br>Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal. | [18] months |
| SR 3.5.1.11 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br><br>Verify the ADS actuates on an actual or simulated automatic initiation signal. | [18] months |
| SR 3.5.1.12 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each ADS valve opens when manually actuated. | [18] months [on a STAGGERED TEST BASIS for each valve solenoid] |

INSERT 1

BASES

ACTIONS (continued)

LOCA could result in the minimum required ECCS equipment not being available. Since both a high pressure system (ADS) and a low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the low pressure ECCS subsystem or the ADS valve to OPERABLE status. This Completion Time is based on a reliability study cited in Reference 12 and has been found to be acceptable through operating experience.

G.1 and G.2

If any Required Action and associated Completion Time of Condition C, D, E, or F is not met, or if two or more ADS valves are inoperable, the plant must be brought to a condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and reactor steam dome pressure reduced to ≤ 150 psig within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

H.1

When multiple ECCS subsystems are inoperable, as stated in Condition H, the plant is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge lines of the HPCI System, CS System, and LPCI subsystems full of water ensures that the ECCS will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. The 31 day Frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls governing system operation, and operating experience.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. For the HPCI System, this SR also includes the steam flow path for the turbine and the flow controller position.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve position would only affect a single subsystem. This Frequency has been shown to be acceptable through operating experience.

INSERT 2

SR 3.5.1.3

Verification ~~every 31 days~~ that ADS air supply header pressure is ≥ [90] psig ensures adequate air pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The design pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least two valve actuations can occur with the drywell at 70% of design pressure (Ref. 11). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ [90] psig is provided by the ADS instrument air supply. The 31 day Frequency takes into consideration administrative controls over operation of the air system and alarms for low air pressure.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.4

Verification every ~~31 days~~ that the RHR System cross tie valve is closed and power to its operator is disconnected ensures that each LPCI subsystem remains independent and a failure of the flow path in one subsystem will not affect the flow path of the other LPCI subsystem. Acceptable methods of removing power to the operator include de-energizing breaker control power or racking out or removing the breaker. If the RHR System cross tie valve is open or power has not been removed from the valve operator, both LPCI subsystems must be considered inoperable. The 31 day Frequency has been found acceptable, considering that these valves are under strict administrative controls that will ensure the valves continue to remain closed with either control or motive power removed.

INSERT 2

SR 3.5.1.5

Verification every ~~31 days~~ that each LPCI inverter output has a voltage of ≥ [570] V and ≤ [630] V while supplying its respective bus demonstrates that the AC electrical power is available to ensure proper operation of the associated LPCI inboard injection and minimum flow valves and the recirculation pump discharge valve. Each inverter must be OPERABLE for the associated LPCI subsystem to be OPERABLE. The 31 day Frequency has been found acceptable based on engineering judgment and operating experience.

SR 3.5.1.6

Cycling the recirculation pump discharge [and bypass] valves through one complete cycle of full travel demonstrates that the valves are mechanically OPERABLE and will close when required. Upon initiation of an automatic LPCI subsystem injection signal, these valves are required to be closed to ensure full LPCI subsystem flow injection in the reactor via the recirculation jet pumps. De-energizing the valve in the closed position will also ensure the proper flow path for the LPCI subsystem. Acceptable methods of de-energizing the valve include de-energizing breaker control power, racking out the breaker or removing the breaker.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The specified Frequency is once during reactor startup before THERMAL POWER is > 25% RTP. However, this SR is modified by a Note that states the Surveillance is only required to be performed if the last performance was more than 31 days ago. Therefore, implementation of this Note requires this test to be performed during reactor startup before exceeding 25% RTP. Verification during reactor startup prior to reaching > 25% RTP is an exception to the normal Inservice Testing Program generic valve cycling Frequency of 92 days, but is considered acceptable due to the demonstrated reliability of these valves. If the valve is inoperable and in the open position, the associated LPCI subsystem must be declared inoperable.

SR 3.5.1.7, SR 3.5.1.8, and SR 3.5.1.9

The performance requirements of the low pressure ECCS pumps are determined through application of the 10 CFR 50, Appendix K criteria (Ref. 8). This periodic Surveillance is performed (in accordance with the ASME Code, Section XI, requirements for the ECCS pumps) to verify that the ECCS pumps will develop the flow rates required by the respective analyses. The low pressure ECCS pump flow rates ensure that adequate core cooling is provided to satisfy the acceptance criteria of Reference 10. The pump flow rates are verified against a system head equivalent to the RPV pressure expected during a LOCA. The total system pump outlet pressure is adequate to overcome the elevation head pressure between the pump suction and the vessel discharge, the piping friction losses, and RPV pressure present during a LOCA. These values may be established during preoperational testing.

The flow tests for the HPCI System are performed at two different pressure ranges such that system capability to provide rated flow is tested at both the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the HPCI System diverts steam flow. Reactor steam pressure must be ≥ [920] psig to perform SR 3.5.1.8 and ≥ [150] psig to perform SR 3.5.1.9. Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. Therefore, sufficient time is allowed after adequate pressure and flow are achieved to perform these tests. Reactor startup is allowed prior to performing the low pressure Surveillance test because the reactor pressure is low and the

BASES

SURVEILLANCE REQUIREMENTS (continued)

time allowed to satisfactorily perform the Surveillance test is short. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed that the low pressure test has been satisfactorily completed and there is no indication or reason to believe that HPCI is inoperable.

Therefore, SR 3.5.1.8 and SR 3.5.1.9 are modified by Notes that state the Surveillances are not required to be performed until 12 hours after the reactor steam pressure and flow are adequate to perform the test.

The Frequency for SR 3.5.1.7 and SR 3.5.1.8 is in accordance with the Inservice Testing Program requirements. The 18 month Frequency for SR 3.5.1.9 is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

SR 3.5.1.10

The ECCS subsystems are required to actuate automatically to perform their design functions. This Surveillance verifies that, with a required system initiation signal (actual or simulated), the automatic initiation logic of HPCI, CS, and LPCI will cause the systems or subsystems to operate as designed, including actuation of the system throughout its emergency operating sequence, automatic pump startup and actuation of all automatic valves to their required positions. This SR also ensures that the HPCI System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlaps this Surveillance to provide complete testing of the assumed safety function.

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

Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note that excludes vessel injection/spray during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

SR 3.5.1.11

The ADS designated S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to demonstrate that the mechanical portions of the ADS function (i.e., solenoids) operate as designed when initiated either by an actual or simulated initiation signal, causing proper actuation of all the required components. SR 3.5.1.12 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

The 18 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

This SR is modified by a Note that excludes valve actuation. This prevents an RPV pressure blowdown.

SR 3.5.1.12

A manual actuation of each ADS valve is performed to verify that the valve and solenoid are functioning properly and that no blockage exists in the S/RV discharge lines. This is demonstrated by the response of the turbine control or bypass valve or by a change in the measured flow or by any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the ADS valves divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to

BASES

SURVEILLANCE REQUIREMENTS (continued)

perform this SR. Adequate pressure at which this SR is to be performed is [920 psig] (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. Reactor startup is allowed prior to performing this SR because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed for manual actuation after the required pressure is reached is sufficient to achieve stable conditions and provides adequate time to complete the Surveillance. SR 3.5.1.11 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

The Frequency of 18 months on a STAGGERED TEST BASIS ensures that both solenoids for each ADS valve are alternately tested. The Frequency is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

REFERENCES

1. FSAR, Section [6.3.2.2.3].
2. FSAR, Section [6.3.2.2.4].
3. FSAR, Section [6.3.2.2.1].
4. FSAR, Section [6.3.2.2.2].
5. FSAR, Section [15.2.8].
6. FSAR, Section [15.6.4].
7. FSAR, Section [15.6.5].
8. 10 CFR 50, Appendix K.
9. FSAR, Section [6.3.3].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| | C.2 | Restore one ECCS injection/spray subsystem to OPERABLE status. | 4 hours |
| D. Required Action C.2 and associated Completion Time not met. | D.1 | Initiate action to restore [secondary] containment to OPERABLE status. | Immediately |
| | AND | | |
| | D.2 | [ Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately ] |
| | AND | | |
| | D.3 | Initiate action to restore isolation capability in each required [secondary] containment penetration flow path not isolated. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.1 | Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ [12 ft 2 inches]. | [12 hours INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.2 | Verify, for each required core spray (CS) subsystem, the:<br><br>a. Suppression pool water level is ≥ [12 ft 2 inches] or<br><br>b. ----------NOTE----------<br>Only one required CS subsystem may take credit for this option during OPDRVs.<br>----------<br>Condensate storage tank water level is ≥ [12 ft]. | [12 hours<br><br>Insert 1 |
| SR 3.5.2.3 | Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve. | [31 days |
| SR 3.5.2.4 | Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.5.2.5 | Verify each required ECCS pump develops the specified flow rate [against a system head corresponding to the specified reactor pressure].<br><br>System / Flow Rate / No. of Pumps / [System Head Corresponding to a Reactor Pressure of]<br><br>CS / ≥ [4250] gpm / [1] / ≥ [113] psig<br>LPCI / ≥ [7700] gpm / [1] / ≥ [20] psig | [In accordance with the Inservice Testing Program or 92 days]<br><br>Insert 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.6 | ----------NOTE----------<br>Vessel injection/spray may be excluded.<br>----------<br><br>Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal. | [18] months<br>INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1 and SR 3.5.2.2

The minimum water level of [12 ft 2 inches] required for the suppression pool is periodically verified to ensure that the suppression pool will provide adequate net positive suction head (NPSH) for the CS System and LPCI subsystem pumps, recirculation volume, and vortex prevention. With the suppression pool water level less than the required limit, all ECCS injection/spray subsystems are inoperable unless they are aligned to an OPERABLE CST.

When suppression pool level is < [12 ft 2 inches], the CS System is considered OPERABLE only if it can take suction from the CST, and the CST water level is sufficient to provide the required NPSH for the CS pump. Therefore, a verification that either the suppression pool water level is ≥ [12 ft 2 inches] or that CS is aligned to take suction from the CST and the CST contains ≥ [150,000] gallons of water, equivalent to 12 ft, ensures that the CS System can supply at least [50,000] gallons of makeup water to the RPV. The CS suction is uncovered at the [100,000] gallon level. However, as noted, only one required CS subsystem may take credit for the CST option during OPDRVs. During OPDRVs, the volume in the CST may not provide adequate makeup if the RPV were completely drained. Therefore, only one CS subsystem is allowed to use the CST. This ensures the other required ECCS subsystem has adequate makeup volume.

The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool water level and CST water level variations and instrument drift 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 suppression pool or CST water level condition. INSERT 2

SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6

The Bases provided for SR 3.5.1.1, SR 3.5.1.7, and SR 3.5.1.10 are applicable to SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6, respectively.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4

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 valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. The 31 day Frequency is appropriate because the valves are operated under procedural control and the probability of their being mispositioned during this time period is low. INSERT 2

REFERENCES 1. FSAR, Section [6.3.2].

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.5.3.1 | Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve. | [31 days |
| SR 3.5.3.2 | Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.5.3.3 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify, with [reactor pressure] ≤ [1020] psig and ≥ [920] psig, the RCIC pump can develop a flow rate ≥ [400] gpm [against a system head corresponding to reactor pressure]. | [92 days |
| SR 3.5.3.4 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify, with [reactor pressure] ≤ [165] psig, the RCIC pump can develop a flow rate ≥ [400] gpm [against a system head corresponding to reactor pressure]. | [18] months |
| SR 3.5.3.5 | ----------NOTE----------<br>Vessel injection may be excluded.<br>----------<br><br>Verify the RCIC System actuates on an actual or simulated automatic initiation signal. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge line of the RCIC System full of water ensures that the system will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. This will also prevent a water hammer following an initiation signal. One acceptable method of ensuring the line is full is to vent at the high points. The 31 day Frequency is based on the gradual nature of void buildup in the RCIC piping, the procedural controls governing system operation, and operating experience.

SR 3.5.3.2

Verifying the correct alignment for manual, power operated, and automatic valves in the RCIC flow path provides assurance that the proper flow path will exist for RCIC operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. For the RCIC System, this SR also includes the steam flow path for the turbine and the flow controller position. INSERT 2

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve position would affect only the RCIC System. This Frequency has been shown to be acceptable through operating experience.

SR 3.5.3.3 and SR 3.5.3.4

The RCIC pump flow rates ensure that the system can maintain reactor coolant inventory during pressurized conditions with the RPV isolated. The flow tests for the RCIC System are performed at two different pressure ranges such that system capability to provide rated flow is tested both at the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main

BASES

SURVEILLANCE REQUIREMENTS (continued)

turbine or turbine bypass valves to continue to control reactor pressure when the RCIC System diverts steam flow. Reactor steam pressure must be ≥ [920] psig to perform SR 3.5.3.3 and ≥ [150] psig to perform SR 3.5.3.4. Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. Therefore, sufficient time is allowed after adequate pressure and flow are achieved to perform these SRs. Reactor startup is allowed prior to performing the low pressure Surveillance because the reactor pressure is low and the time allowed to satisfactorily perform the Surveillance is short. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed that the low pressure Surveillance has been satisfactorily completed and there is no indication or reason to believe that RCIC is inoperable. Therefore, these SRs are modified by Notes that state the Surveillances are not required to be performed until 12 hours after the reactor steam pressure and flow are adequate to perform the test.

A 92 day Frequency for SR 3.5.3.3 is consistent with the Inservice Testing Program requirements. The 18 month Frequency for SR 3.5.3.4 is based on the need to perform the Surveillance under conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

SR 3.5.3.5

The RCIC System is required to actuate automatically in order to verify its design function satisfactorily. This Surveillance verifies that, with a required system initiation signal (actual or simulated), the automatic initiation logic of the RCIC System will cause the system to operate as designed, including actuation of the system throughout its emergency operating sequence; that is, automatic pump startup and actuation of all automatic valves to their required positions. This test also ensures the RCIC System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.2 overlaps this Surveillance to provide complete testing of the assumed safety function.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 18 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Insert 2

This SR is modified by a Note that excludes vessel injection during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 33.

2. FSAR, Section [5.5.6].

3. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.1.2 | Verify drywell to suppression chamber differential pressure does not decrease at a rate > [0.25] inch water gauge per minute tested over a [10] minute period at an initial differential pressure of [1] psid. | [18] months<br><br>AND<br><br>--------NOTE--------<br>Only required after two consecutive tests fail and continues until two consecutive tests pass<br>----------<br><br>[9] months |

Insert 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

----------REVIEWER'S NOTE----------
Regulatory Guide 1.163 and NEI 94-01 include acceptance criteria for as-left and as-found Type A leakage rates and combined Type B and C leakage rates, which may be reflected in the Bases.
---

SR 3.6.1.1.2

Maintaining the pressure suppression function of primary containment requires limiting the leakage from the drywell to the suppression chamber. Thus, if an event were to occur that pressurized the drywell, the steam would be directed through the downcomers into the suppression pool. This SR measures drywell to suppression chamber differential pressure during a [10] minute period to ensure that the leakage paths that would bypass the suppression pool are within allowable limits.

Satisfactory performance of this SR can be achieved by establishing a known differential pressure between the drywell and the suppression chamber and verifying that the pressure in either the suppression chamber or the drywell does not change by more than [0.25] inch of water per minute over a 10 minute period. The leakage test is performed every [18 months]. The [18 month] Frequency was developed considering it is prudent that this Surveillance be performed during a unit outage and also in view of the fact that component failures that might have affected this test are identified by other primary containment SRs. Two consecutive test failures, however, would indicate unexpected primary containment degradation; in this event, as the Note indicates, increasing the Frequency to once every [9 months] is required until the situation is remedied as evidenced by passing two consecutive tests. INSERT 2

REFERENCES

1. FSAR, Section [6.2].
2. FSAR, Section [15.1.39].
3. 10 CFR 50, Appendix J, Option [A][B].

SURVEILLANCE REQUIREMENTS

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.1

Maintaining primary containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Primary Containment Leakage Rate Testing Program. This SR reflects the leakage rate testing requirements with respect to air lock leakage (Type B leakage tests). The acceptance criteria were established [during initial air lock and primary containment OPERABILITY testing]. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The Frequency is required by the Primary 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 3.6.1.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C primary containment leakage.

SR 3.6.1.2.2

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure, closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. [Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the primary containment airlock 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 primary 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 24 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during the use of the airlock. INSERT 2

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.1 | ----------NOTE----------<br>[ [Only required to be met in MODES 1, 2, and 3.]<br>----------<br><br>Verify each [18] inch primary containment purge valve is sealed closed except for one purge valve in a penetration flow path while in Condition E of this LCO. | [31 days ] |
| SR 3.6.1.3.2 | ----------NOTES----------<br>[ 1. [Only required to be met in MODES 1, 2, and 3.]<br><br>2. Not required to be met when the [18] inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open.<br>----------<br><br>Verify each [18] inch primary containment purge valve is closed. | [31 days ] |
| SR 3.6.1.3.3 | ----------NOTES----------<br>1. Valves and blind flanges in high radiation areas may be verified by use of administrative means.<br><br>2. Not required to be met for PCIVs that are open under administrative controls.<br>----------<br><br>Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.4 | ----------NOTES----------<br>1. Valves and blind flanges in high radiation areas may be verified by use of administrative means.<br>2. Not required to be met for PCIVs that are open under administrative controls.<br>----------<br><br>Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days |
| SR 3.6.1.3.5 | Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge. | [31 days |
| SR 3.6.1.3.6 | Verify the isolation time of each power operated automatic PCIV, [except for MSIVs], is within limits. | [In accordance with the Inservice Testing Program or 92 days] INSERT 1 |
| SR 3.6.1.3.7 | ----------NOTE----------<br>[ [Only required to be met in MODES 1, 2 and 3.]<br>----------<br><br>Perform leakage rate testing for each primary containment purge valve with resilient seals. | [184 days<br><br>AND<br><br>Once within 92 days after opening the valve ] |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.8 | Verify the isolation time of each MSIV is ≥ [2] seconds and ≤ [8] seconds. | [In accordance with the Inservice Testing Program or [18 months] |
| SR 3.6.1.3.9 | Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal. | [18] months |
| ----------REVIEWER'S NOTE---------- The bracketed portions of the SR apply to the representative sample as discussed in NEDO-32977-A. ---------- | | |
| SR 3.6.1.3.10 | Verify each [a representative sample of] reactor instrumentation line EFCV actuates [on a simulated instrument line break to restrict flow to ≤ 1 gph]. | [18] months |
| SR 3.6.1.3.11 | Remove and test the explosive squib from each shear isolation valve of the TIP System. | [18] months on a STAGGERED TEST BASIS |
| SR 3.6.1.3.12 | ----------NOTE---------- [ [Only required to be met in MODES 1, 2, and 3.] ----------<br><br>Verify the combined leakage rate for all secondary containment bypass leakage paths is ≤ [ ] $L_a$ when pressurized to ≥ [ ] psig. | In accordance with the Primary Containment Leakage Rate Testing Program ] |
| SR 3.6.1.3.13 | ----------NOTE---------- [Only required to be met in MODES 1, 2, and 3.] ----------<br><br>Verify leakage rate through each MSIV is ≤ [11.5] scfh when tested at ≥ [28.8] psig. | [In accordance with the Primary Containment Leakage Rate Testing Program] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.14 | ----------NOTE----------<br>[Only required to be met in MODES 1, 2, and 3.]<br>----------<br><br>Verify combined leakage rate through hydrostatically tested lines that penetrate the primary containment is within limits. | In accordance with the Primary Containment Leakage Rate Testing Program |
| SR 3.6.1.3.15 | ----------NOTE----------<br>[ [Only required to be met in MODES 1, 2, and 3.]<br>----------<br><br>Verify each [ ] inch primary containment purge valve is blocked to restrict the valve from opening > [50]%. | [18] months ]<br>INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

[ SR 3.6.1.3.1

Each [18] inch primary containment purge valve is required to be verified sealed closed at 31 day intervals. This SR is designed to ensure that a gross breach of primary containment is not caused by an inadvertent or spurious opening of a primary containment purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Primary containment purge valves that are sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. [The 31 day Frequency is a result of an NRC initiative, Generic Issue B-24 (Ref. 4) related to primary containment purge valve use during unit operations.

INSERT 2

This SR allows a valve that is open under administrative controls to not meet the SR during the time the valve is open. Opening a purge valve under administrative controls is restricted to one valve in a penetration flow path at a given time (refer to discussion for Note 1 of the ACTIONS) in order to effect repairs to that valve. This allows one purge valve to be opened without resulting in a failure of the Surveillance and resultant entry into the ACTIONS for this purge valve, provided the stated restrictions are met. Condition E must be entered during this allowance, and the valve opened only as necessary for effecting repairs. Each purge valve in the penetration flow path may be alternately opened, provided one remains sealed closed, if necessary, to complete repairs on the penetration.

[ The SR is modified by a Note stating that primary containment purge valves are only required to be sealed closed in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, the purge valves may not be capable of closing before the pressure pulse affects systems downstream of the purge valves or the release of radioactive material will exceed limits prior to the closing of the purge valves. At other times when the purge valves are required to be capable of closing (e.g., during handling of [recently] irradiated fuel), pressurization concerns are not present and the purge valves are allowed to be open. ] ]

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.6.1.3.2

This SR ensures that the primary containment purge valves are closed as required or, if open, open for an allowable reason. If a purge valve is open in violation of this SR, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. [The SR is also modified by a Note (Note 1), stating that primary containment purge valves are only required to be closed in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, the purge valves may not be capable of closing before the pressure pulse affects systems downstream of the purge valves, or the release of radioactive material will exceed limits prior to the purge valves closing. At other times when the purge valves are required to be capable of closing (e.g., during handling of irradiated fuel), pressurization concerns are not present and the purge valves are allowed to be open.] The SR is modified by a Note (Note 2) stating that the SR is not required to be met when the purge valves are open for the stated reasons. The Note states that these valves may be opened for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. The [18] inch purge valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency is consistent with other PCIV requirements discussed in SR 3.6.1.3.3. ]

SR 3.6.1.3.3

INSERT 2

This SR verifies that each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design limits.

This SR does not require any testing or valve manipulation. Rather, it involves verification that those PCIVs outside primary containment, and capable of being mispositioned, are in the correct position. Since verification of valve position for PCIVs outside primary containment is relatively easy, the 31 day Frequency was chosen to provide added assurance that the PCIVs are in the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.5

The traversing incore probe (TIP) shear isolation valves are actuated by explosive charges. Surveillance of explosive charge continuity provides assurance that TIP valves will actuate when required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. The 31 day Frequency is based on operating experience that has demonstrated the reliability of the explosive charge continuity.

SR 3.6.1.3.6

The isolation time is in accordance with the Inservice Testing Program.

Verifying the isolation time of each power operated, automatic PCIV is within limits is required to demonstrate OPERABILITY. MSIVs may be excluded from this SR since MSIV full closure isolation time is demonstrated by SR 3.6.1.3.7. The isolation time test ensures that the valve will isolate in a time period less than or equal to that assumed in the safety analyses. The ~~isolation time and~~ Frequency of this SR ~~are~~ [in is accordance with the requirements of the Inservice Testing Program or 92 days].

INSERT 2

[ SR 3.6.1.3.7

For primary containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option [A][B] (Ref. 3), is required to ensure OPERABILITY. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between primary containment and the environment), a Frequency of 184 days was established.

Additionally, this SR must be performed once within 92 days after opening the valve. The 92 day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that which occurs to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure after a valve has been opened.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The SR is modified by a Note stating that the primary containment purge valves are only required to meet leakage rate testing requirements in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, purge valve leakage must be minimized to ensure offsite radiological release is within limits. At other times when the purge valves are required to be capable of closing (e.g., during handling of [recently] irradiated fuel), pressurization concerns are not present and the purge valves are not required to meet any specific leakage criteria. ]

SR 3.6.1.3.8

Verifying that the isolation time of each MSIV is within the specified limits is required to demonstrate OPERABILITY. The isolation time test ensures that the MSIV will isolate in a time period that does not exceed the times assumed in the DBA analyses. This ensures that the calculated radiological consequences of these events remain within 10 CFR 100 limits. The Frequency of this SR is [in accordance with the requirements of the Inservice Testing Program or 18 months].

Insert 2

SR 3.6.1.3.9

Automatic PCIVs close on a primary containment isolation signal to prevent leakage of radioactive material from primary containment following a DBA. This SR ensures that each automatic PCIV will actuate to its isolation position on a primary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.7 overlaps this SR to provide complete testing of the safety function. The [18] month Frequency was developed considering it is prudent that this Surveillance be performed only during a unit outage since isolation of penetrations would eliminate cooling water flow and disrupt the normal operation of many critical components. Operating experience 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.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.10

----------REVIEWER'S NOTE----------
The Surveillance is only allowed for those plants for which NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation," June 2000, is applicable. In addition, the licensee must develop EFCV performance criteria and basis to ensure that their corrective action program can provide meaningful feedback for appropriate corrective actions. The EFCV performance criteria and basis must be found acceptable by the technical staff. If required, an Inservice Testing Program relief request pursuant to 10 CFR 50.55a needs to be approved by the Technical Staff in order to implement this Surveillance. Otherwise, each EFCV shall be verified to actuate on an [18] month Frequency. The bracketed portions of these Bases apply to the representative sample as discussed in NEDO-32977-A.
---

This SR requires a demonstration that each [a representative sample of] reactor instrumentation line excess flow check valves (EFCV) is OPERABLE by verifying that the valve [reduces flow to ≤ 1 gph on a simulated instrument line break]. [The representative sample consists of an approximately equal number of EFCVs, such that each EFCV is tested at least once every 10 years (nominal). In addition, the EFCVs in the sample are representative of the various plant configurations, models, sizes and operating environments. This ensures that any potentially common problem with a specific type or application of EFCV is detected at the earliest possible time.]

This SR provides assurance that the instrumentation line EFCVs will perform so that predicted radiological consequences will not be exceeded during the postulated instrument line break event evaluated in Reference 6. [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. 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. [The nominal 10 year interval is based on performance testing as discussed in NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation." Furthermore, any EFCV failures will be evaluated to determine if additional testing in that test interval is warranted to ensure overall reliability is maintained. Operating experience has demonstrated that these components are highly reliable and that failures to isolate are very infrequent. Therefore, testing of a representative sample was concluded to be acceptable from a reliability standpoint.]

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.11

The TIP shear isolation valves are actuated by explosive charges. An in place functional test is not possible with this design. The explosive squib is removed and tested to provide assurance that the valves will actuate when required. The replacement charge for the explosive squib shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. The Frequency of 18 months on a STAGGERED TEST BASIS is considered adequate given the administrative controls on replacement charges and the frequent checks of circuit continuity (SR 3.6.1.3.5).

INSERT 2

[ SR 3.6.1.3.12

This SR ensures that the leakage rate of secondary containment bypass leakage paths is less than the specified leakage rate. This provides assurance that the assumptions in the radiological evaluations of Reference 7 are met. The leakage rate of each bypass leakage path is assumed to be the maximum pathway leakage (leakage through the worse of the two isolation valves) unless the penetration is isolated by use of one closed and de-activated automatic valve, closed manual valve, or blind flange. In this case, the leakage rate of the isolated bypass leakage path is assumed to be the actual pathway leakage through the isolation device. If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. The Frequency is required by the Primary Containment Leakage Rate Testing Program. This SR simply imposes additional acceptance criteria. [This SR is modified by a Note that states that these valves are only required to meet this leakage limit in MODES 1, 2, and 3. In the other conditions, the Reactor Coolant System is not pressurized and specific primary containment leakage limits are not required. ]

[Bypass leakage is considered part of $L_a$.

----------REVIEWER'S NOTE----------
Unless specifically exempted.] ]
---

BASES

SURVEILLANCE REQUIREMENTS (continued)

Verifying each [ ] inch primary containment purge valve is blocked to restrict opening to ≤ [50]% is required to ensure that the valves can close under DBA conditions within the times assumed in the analysis of References 1 and 6. [The SR is modified by a Note stating that this SR is only required to be met in MODES 1, 2, and 3.] If a LOCA occurs, the purge valves must close to maintain containment leakage within the values assumed in the accident analysis. At other times when purge valves are required to be capable of closing (e.g., during movement of irradiated fuel assemblies), pressurization concerns are not present, thus the purge valves can be fully open. The [18] month Frequency is appropriate because the blocking devices are typically removed only during a refueling outage. ] INSERT 2

REFERENCES

1. FSAR, Chapter [15].
2. FSAR, Table [6.2-5].
3. 10 CFR 50, Appendix J, Option [A][B].
4. Generic Issue B-24.
5. FSAR, Section 6.2.[ ].
6. FSAR, Section [15.1.39].
7. FSAR, Section [6.2].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.4 Drywell Pressure

LCO 3.6.1.4 Drywell pressure shall be [≤ 0.75 psig].

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Drywell pressure not within limit. | A.1 Restore drywell pressure to within limit. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.6.1.4.1 Verify drywell pressure is within limit. | [12 hours |

Insert 1

BASES

ACTIONS (continued)

B.1 and B.2

If drywell pressure cannot be restored to within limit within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.4.1

Verifying that drywell pressure is within limit ensures that unit operation remains within the limit assumed in the primary containment analysis. The 12 hour Frequency of this SR was developed, based on operating experience related to trending of drywell 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 drywell pressure condition. INSERT 2

REFERENCES

1. FSAR, Section [6.2].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.5 Drywell Air Temperature

LCO 3.6.1.5 Drywell average air temperature shall be ≤ [135]°F.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Drywell average air temperature not within limit. | A.1 Restore drywell average air temperature to within limit. | 8 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.5.1 | Verify drywell average air temperature is within limit. | [24 hours INSERT 1 |

BASES

ACTIONS

A.1

With drywell average air temperature not within the limit of the LCO, drywell average air temperature must be restored within 8 hours. The Required Action is necessary to return operation to within the bounds of the primary containment analysis. The 8 hour Completion Time is acceptable, considering the sensitivity of the analysis to variations in this parameter, and provides sufficient time to correct minor problems.

B.1 and B.2

If the drywell average air temperature cannot be restored to within limit within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.5.1

Verifying that the drywell average air temperature is within the LCO limit ensures that operation remains within the limits assumed for the primary containment analyses. Drywell air temperature is monitored in all quadrants and at various elevations (referenced to mean sea level). Due to the shape of the drywell, a volumetric average is used to determine an accurate representation of the actual average temperature.

The 24 hour Frequency of the SR was developed based on operating experience related to drywell average air temperature variations and temperature instrument drift during the applicable MODES and the low probability of a DBA occurring between surveillances. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal drywell air temperature condition. INSERT 2

REFERENCES

1. FSAR, Section [6.2].
2. FSAR, Section [6.2.1.4.1].
3. FSAR, Section [6.2.1.4.5].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.6.1 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each LLS valve opens when manually actuated. | [18] months [on a STAGGERED TEST BASIS for each valve solenoid]<br>INSERT 1 |
| SR 3.6.1.6.2 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br><br>Verify the LLS System actuates on an actual or simulated automatic initiation signal. | 18 months |

BASES

SURVEILLANCE REQUIREMENTS (continued)

manufacturer). Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the LLS valves divert steam flow upon opening. Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. [The [18] month Frequency was based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 2). The Frequency of 18 months on a STAGGERED TEST BASIS ensures that each solenoid for each S/RV is alternately tested. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

Since steam pressure is required to perform the Surveillance, however, and steam may not be available during a unit outage, the Surveillance may be performed during the startup following a unit outage. Unit startup is allowed prior to performing the test because valve OPERABILITY and the setpoints for overpressure protection are verified by Reference 2 prior to valve installation. After adequate reactor steam dome pressure and flow are reached, 12 hours is allowed to prepare for and perform the test.

SR 3.6.1.6.2

The LLS designated S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the LLS function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.7 overlaps this SR to provide complete testing of the safety function.

[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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

This SR is modified by a Note that excludes valve actuation. This prevents a reactor pressure vessel pressure blowdown.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Required Action and Associated Completion Time not met. | E.1 Be in MODE 3.<br>AND<br>E.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.7.1 | ----------NOTES----------<br>1. Not required to be met for vacuum breakers that are open during Surveillances.<br>2. Not required to be met for vacuum breakers open when performing their intended function.<br>----------<br>Verify each vacuum breaker is closed. | [14 days |
| SR 3.6.1.7.2 | Perform a functional test of each vacuum breaker. | [92] days |
| SR 3.6.1.7.3 | Verify the opening setpoint of each vacuum breaker is ≤ [0.5] psid. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

E.1 and E.2

If all the vacuum breakers in [one] line cannot be closed or restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.7.1

Each vacuum breaker is verified to be closed to ensure that a potential breach in the primary containment boundary is not present. This Surveillance is performed by observing local or control room indications of vacuum breaker position or by verifying a differential pressure of [0.5] psid is maintained between the reactor building and suppression chamber. The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.

Two Notes are added to this SR. The first Note allows reactor-to-suppression chamber vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers. The second Note is included to clarify that vacuum breakers open due to an actual differential pressure are not considered as failing this SR.

SR 3.6.1.7.2

INSERT 2

Each vacuum breaker must be cycled to ensure that it opens properly to perform its design function and returns to its fully closed position. This ensures that the safety analysis assumptions are valid. The [92] day Frequency of this SR was developed based upon Inservice Testing Program requirements to perform valve testing at least once every [92] days.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.7.3

Demonstration of vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of ≤ [0.5] psid is valid. The [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. For this unit, the [18] month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker. INSERT 2

REFERENCES 1. FSAR, Section [6.2].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.8.1 | ----------NOTE----------<br>Not required to be met for vacuum breakers that are open during Surveillances.<br>----------<br><br>Verify each vacuum breaker is closed. | 14 days (Insert 1)<br><br>AND<br><br>Within 2 hours after any discharge of steam to the suppression chamber from the safety/relief valves (S/RVs) or any operation that causes the drywell-to-suppression chamber differential pressure to be reduced by ≥ [0.5] psid |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.8.2 | Perform a functional test of each required vacuum breaker. | [31 days<br>AND<br>Within 12 hours after any discharge of steam to the suppression chamber from the S/RVs<br>AND<br>Within 12 hours following an operation that causes any of the vacuum breakers to open |
| SR 3.6.1.8.3 | Verify the opening setpoint of each required vacuum breaker is ≤ [0.5] psid. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

C.1 and C.2

If the inoperable suppression chamber-to-drywell vacuum breaker cannot be closed or restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.8.1

Each vacuum breaker is verified closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker position indication or by verifying that a differential pressure of [0.5] psid between the suppression chamber and drywell is maintained for 1 hour without makeup. The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience. This verification is also required within 2 hours after any discharge of steam to the suppression chamber from the safety/relief valves or any operation that causes the drywell-to-suppression chamber differential pressure to be reduced by ≥ [0.5] psid.

INSERT 2

A Note is added to this SR which allows suppression chamber-to-drywell vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers.

SR 3.6.1.8.2

Each required vacuum breaker must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This ensures that the safety analysis assumptions are valid. The 31 day Frequency of this SR was developed, based on Inservice Testing Program requirements to perform valve testing at least once

BASES

SURVEILLANCE REQUIREMENTS (continued)

every 92 days. A 31 day Frequency was chosen to provide additional assurance that the vacuum breakers are OPERABLE, since they are located in a harsh environment (the suppression chamber airspace). In addition, this functional test is required within 12 hours after either a discharge of steam to the suppression chamber from the safety/relief valves or after an operation that causes any of the vacuum breakers to open.

SR 3.6.1.8.3

INSERT 2

Verification of the vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of [0.5] psid is valid. The [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. For this facility, the [18] month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.

REFERENCES 1. FSAR, Section [6.2].

3.6 CONTAINMENT SYSTEMS

3.6.1.9 Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)

LCO 3.6.1.9 Two MSIV LCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One MSIV LCS subsystem inoperable. | A.1 | Restore MSIV LCS subsystem to OPERABLE status. | 30 days |
| B. Two MSIV LCS subsystems inoperable. | B.1 | Restore one MSIV LCS subsystem to OPERABLE status. | 7 days |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.9.1 | Operate each MSIV LCS blower ≥ [15] minutes. | [31 days |
| SR 3.6.1.9.2 | Verify electrical continuity of each inboard MSIV LCS subsystem heater element circuitry. | [31 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.9.3 | Perform a system functional test of each MSIV LCS subsystem. | [18] months INSERT 1 |

BASES

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment. Therefore, MSIV LCS OPERABILITY is required during these MODES. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the MSIV LCS OPERABLE is not required in MODE 4 or 5 to ensure MSIV leakage is processed.

ACTIONS

A.1

With one MSIV LCS subsystem inoperable, the inoperable MSIV LCS subsystem must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MSIV LCS subsystem is adequate to perform the required leakage control function. However, the overall reliability is reduced because a single failure in the remaining subsystem could result in a total loss of MSIV leakage control function. The 30 day Completion Time is based on the redundant capability afforded by the remaining OPERABLE MSIV LCS subsystem and the low probability of a DBA LOCA occurring during this period.

B.1

With two MSIV LCS subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of the occurrence of a DBA LOCA.

C.1 and C.2

If the MSIV LCS subsystem cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.9.1

Each MSIV LCS blower is operated for ≥ [15] minutes to verify OPERABILITY. [The 31 day Frequency was developed considering the known reliability of the LCS blower and controls, the two subsystem redundancy, and the low probability of a significant degradation of the MSIV LCS subsystems occurring between surveillances and has been shown to be acceptable through operating experience.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.9.2

The electrical continuity of each inboard MSIV LCS subsystem heater is verified by a resistance check, by verifying that the rate of temperature increase meets specifications, or by verifying that the current or wattage draw meets specifications. The 31 day Frequency is based on operating experience that has shown that these components usually pass this Surveillance when performed at this Frequency.

SR 3.6.1.9.3

A system functional test is performed to ensure that the MSIV LCS will operate through its operating sequence. This includes verifying that the automatic positioning of the valves and the operation of each interlock and timer are correct, that the blowers start and develop the required flow rate and the necessary vacuum, and that the upstream heaters meet current or wattage draw requirements (if not used to verify electrical continuity in SR 3.6.1.9.2). 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. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. FSAR, Section [6.5].
2. Regulatory Guide 1.96, Revision [1].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Suppression pool average temperature > [120]°F. | E.1 Depressurize the reactor vessel to < [200] psig. | 12 hours |
| | AND | |
| | E.2 Be in MODE 4. | [36 hours] |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.1.1 | Verify suppression pool average temperature is within the applicable limits. | [24 hours INSERT 1<br>AND<br>5 minutes when performing testing that adds heat to the suppression pool |

BASES

ACTIONS (continued)

Continued addition of heat to the suppression pool with suppression pool temperature > [120]°F could result in exceeding the design basis maximum allowable values for primary containment temperature or pressure. Furthermore, if a blowdown were to occur when the temperature was > [120]°F, the maximum allowable bulk and local temperatures could be exceeded very quickly.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1.1

The suppression pool average temperature is regularly monitored to ensure that the required limits are satisfied. The average temperature is determined by taking an arithmetic average of OPERABLE suppression pool water temperature channels. The 24 hour Frequency has been shown, based on operating experience, to be acceptable. When heat is being added to the suppression pool by testing, however, it is necessary to monitor suppression pool temperature more frequently. The 5 minute Frequency during testing is justified by the rates at which tests will heat up the suppression pool, has been shown to be acceptable based on operating experience, and provides assurance that allowable pool temperatures are not exceeded. The Frequencies are further justified in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool average temperature condition.

Insert 2

y is

REFERENCES

1. FSAR, Section [6.2].
2. FSAR, Section [15.1].
3. NUREG-0783.
4. [ Mark I Containment Program. ]

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be ≥ [12 ft 2 inches] and ≤ [12 ft 6 inches].

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Suppression pool water level not within limits. | A.1 Restore suppression pool water level to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.2.1 | Verify suppression pool water level is within limits. | 24 hours INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2.1

Verification of the suppression pool water level is to ensure that the required limits are satisfied. The 24 hour Frequency of this SR was developed considering operating experience related to trending variations in suppression pool water level and water level instrument drift during the applicable MODES and to assessing the proximity to the specified LCO level limits. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool water level condition.

Insert 2

REFERENCES

1. FSAR, Section [6.2].

3.6 CONTAINMENT SYSTEMS

3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling

LCO 3.6.2.3 Two RHR suppression pool cooling subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One RHR suppression pool cooling subsystem inoperable. | A.1 | Restore RHR suppression pool cooling subsystem to OPERABLE status. | 7 days |
| B. Two RHR suppression pool cooling subsystems inoperable. | B.1 | Restore one RHR suppression pool cooling subsystem to OPERABLE status. | 8 hours |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.3.1 | Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position. | [31 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.3.2 | Verify each RHR pump develops a flow rate > [7700] gpm through the associated heat exchanger while operating in the suppression pool cooling mode. | [In accordance with the Inservice Testing Program or 92 days] |

Insert 1.

BASES

ACTIONS (continued)

C.1 and C.2

If the Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR suppression pool cooling mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

[The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

Insert 2

SR 3.6.2.3.2

Verifying that each RHR pump develops a flow rate ≥ [7700] gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME Code, Section XI (Ref. 2). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. [The Frequency of this SR is [in accordance with the Inservice Testing Program or 92 days].

3.6 CONTAINMENT SYSTEMS

3.6.2.4 Residual Heat Removal (RHR) Suppression Pool Spray

LCO 3.6.2.4 Two RHR suppression pool spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One RHR suppression pool spray subsystem inoperable. | A.1 | Restore RHR suppression pool spray subsystem to OPERABLE status. | 7 days |
| B. Two RHR suppression pool spray subsystems inoperable. | B.1 | Restore one RHR suppression pool spray subsystem to OPERABLE status. | 8 hours |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

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

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.4.2 | [ Verify each RHR pump develops a flow rate ≥ [400] gpm through the heat exchanger while operating in the suppression pool spray mode. | In accordance with the Inservice Testing Program or 92 days ] |

Insert 1

BASES

ACTIONS (continued)

C.1 and C.2

If the inoperable RHR suppression pool spray subsystem cannot be restored 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 12 hours and MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR suppression pool spray mode flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

INSERT 2

SR 3.6.2.4.2

Verifying each RHR pump develops a flow rate ≥ [400] gpm while operating in the suppression pool spray mode with flow through the heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by Section XI of the ASME Code (Ref. 2). This test confirms one point on

BASES

SURVEILLANCE REQUIREMENTS (continued)

the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is [in accordance with the Inservice Testing Program, but the Frequency must not exceed 92 days].

Insert 2

REFERENCES

1. FSAR, Section [6.2].
2. ASME, Boiler and Pressure Vessel Code, Section XI.

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.5 Drywell-to-Suppression Chamber Differential Pressure

LCO 3.6.2.5 The drywell pressure shall be maintained ≥ [1.5] psid above the pressure of the suppression chamber.

APPLICABILITY: MODE 1 during the time period:

a. From [24] hours after THERMAL POWER is > [15]% RTP following startup, to

b. [24] hours prior to reducing THERMAL POWER to < [15]% RTP prior to the next scheduled reactor shutdown.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Drywell-to-suppression chamber differential pressure not within limit. | A.1 Restore differential pressure to within limit. | 8 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to ≤ [15]% RTP. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.5.1 | Verify drywell-to-suppression chamber differential pressure is within limit. | [12 hours INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.5.1

The drywell-to-suppression chamber differential pressure is regularly monitored to ensure that the required limits are satisfied. The 12 hour Frequency of this SR was developed based on operating experience relative to differential pressure variations and pressure instrument drift during applicable MODES and by assessing the proximity to the specified LCO differential pressure limit. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal pressure condition. INSERT 2

REFERENCES None.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.1.1 | Operate each [required] [drywell cooling system fan] for ≥ [15] minutes. | [92 days |
| SR 3.6.3.1.2 | [ Verify each [required] [drywell cooling system fan] flow rate is ≥ [500] scfm. | [18] months ] |

INSERT 1

BASES

ACTIONS (continued)

[Both] the [initial] verification [and all subsequent verifications] may be performed as an administrative check by examining logs or other information to determine the availability of the alternate hydrogen control system. It does not mean to perform the Surveillances needed to demonstrate OPERABILITY of the alternate hydrogen control system. If the ability to perform the hydrogen control function is maintained, continued operation is permitted with two [Drywell Cooling System fans] inoperable for up to 7 days. Seven days is a reasonable time to allow two [Drywell Cooling System fans] to be inoperable because the hydrogen control function is maintained and because of the low probability of the occurrence of a LOCA that would generate hydrogen in amounts capable of exceeding the flammability limit.

C.1

If any Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1.1

Operating each [required] [Drywell Cooling System fan] for ≥ 15 minutes ensures that each subsystem is OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 92 day Frequency is consistent with the Inservice Testing Program Frequencies, operating experience, the known reliability of the fan motors and controls, and the two redundant fans available.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.6.3.1.2

Verifying that each [required] [Drywell Cooling System fan] flow rate is ≥ [500] scfm ensures that each fan is capable of maintaining localized hydrogen concentrations below the flammability limit. 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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.] INSERT 2

REFERENCES

1. Regulatory Guide 1.7, Revision [1].
2. FSAR, Section [6.2.5].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.3.2 Primary Containment Oxygen Concentration

LCO 3.6.3.2 The primary containment oxygen concentration shall be < 4.0 volume percent.

APPLICABILITY: MODE 1 during the time period:

a. From [24] hours after THERMAL POWER is > [15]% RTP following startup, to

b. [24] hours prior to reducing THERMAL POWER to < [15]% RTP prior to the next scheduled reactor shutdown.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Primary containment oxygen concentration not within limit. | A.1 Restore oxygen concentration to within limit. | 24 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to ≤ [15]% RTP. | 8 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.2.1 | Verify primary containment oxygen concentration is within limits. | [7 days INSERT 1 |

BASES

ACTIONS

A.1

If oxygen concentration is ≥ 4.0 v/o at any time while operating in MODE 1, with the exception of the relaxations allowed during startup and shutdown, oxygen concentration must be restored to < 4.0 v/o within 24 hours. The 24 hour Completion Time is allowed when oxygen concentration is ≥ 4.0 v/o because of the low probability and long duration of an event that would generate significant amounts of hydrogen occurring during this period.

B.1

If oxygen concentration cannot be restored to within limits within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, power must be reduced to ≤ [15]% RTP within 8 hours. The 8 hour Completion Time is reasonable, based on operating experience, to reduce reactor power from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2.1

The primary containment must be determined to be inert by verifying that oxygen concentration is < 4.0 v/o. The 7 day Frequency is based on the slow rate at which oxygen concentration can change and on other indications of abnormal conditions (which would lead to more frequent checking by operators in accordance with plant procedures). Also, this Frequency has been shown to be acceptable through operating experience. INSERT 2

REFERENCES

1. FSAR, Section [6.2.5].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.3.1 | Verify ≥ [4350] gal of liquid nitrogen are contained in the CAD System. | [31 days |
| SR 3.6.3.3.2 | Verify each CAD subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position. | [31 days |

INSERT 1

BASES

ACTIONS (continued)

C.1

If any Required Action cannot be met within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.3.1

Verifying that there is ≥ [4350] gal of liquid nitrogen supply in the CAD System will ensure at least [7] days of post-LOCA CAD operation. This minimum volume of liquid nitrogen allows sufficient time after an accident to replenish the nitrogen supply for long term inerting. This is verified every 31 days to ensure that the system is capable of performing its intended function when required. The 31 day Frequency is based on operating experience, which has shown 31 days to be an acceptable period to verify the liquid nitrogen supply and on the availability of other hydrogen mitigating systems.

INSERT 2

SR 3.6.3.3.2

Verifying the correct alignment for manual, power operated, and automatic valves in each of the CAD subsystem flow paths provides assurance that the proper flow paths exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing.

A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable because the CAD System is manually initiated. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 31 day Frequency is appropriate because the valves are operated under procedural control, improper valve position would only affect a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system. INSERT 2

REFERENCES

1. Regulatory Guide 1.7, Revision [2].
2. FSAR, Section [ ].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.1.1 | [ Verify [secondary] containment vacuum is ≥ [0.25] inch of vacuum water gauge. | [24 hours] |
| SR 3.6.4.1.2 | Verify all [secondary] containment equipment hatches are closed and sealed. | [31 days |
| SR 3.6.4.1.3 | Verify one [secondary] containment access door in each access opening is closed. | [31 days |
| SR 3.6.4.1.4 | [ Verify [secondary] containment can be drawn down to ≥ [0.25] inch of vacuum water gauge in ≤ [120] seconds using one standby gas treatment (SGT) subsystem. | [18] months on a STAGGERED TEST BASIS for each subsystem.] |
| SR 3.6.4.1.5 | Verify the [secondary] containment can be maintained ≥ [0.25] inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate ≤ [4000] cfm. | [18] months on a STAGGERED TEST BASIS for each SGT subsystem |

INSERT 1

BASES

ACTIONS (continued)

C.1 and C.2

Movement of [recently] irradiated fuel assemblies in the [secondary] containment and OPDRVs can be postulated to cause significant fission product release to the [secondary] containment. In such cases, the [secondary] containment is the only barrier to release of fission products to the environment. Therefore, movement of [recently] irradiated fuel assemblies must be immediately suspended if the [secondary] containment is inoperable.

Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. Also, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

Required Action C.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving [recently] irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of [recently] irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

[ SR 3.6.4.1.1

This SR ensures that the [secondary] containment boundary is sufficiently leak tight to preclude exfiltration under expected wind conditions. The 24 hour Frequency of this SR was developed based on operating experience related to [secondary] containment vacuum variations during the applicable MODES and the low probability of a DBA occurring between surveillances.

Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal [secondary] containment vacuum condition.]

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.1.2 and SR 3.6.4.1.3

Verifying that [secondary] containment equipment hatches and one access door in each access opening are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the [secondary] containment will not occur. In this application, the term "sealed" has no connotation of leak tightness. Maintaining [secondary] containment OPERABILITY requires verifying one door in the access opening is closed. [An access opening contains one inner and one outer door. In some cases, [secondary] containment access openings are shared such that a [secondary] containment barrier may have multiple inner or multiple outer doors. The intent is to not breach the [secondary] containment at any time when [secondary] containment is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times.] However, all [secondary] containment access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. [The 31 day Frequency for these SRs has been shown to be adequate, based on operating experience, and is considered adequate in view of the other indications of door and hatch status that are available to the operator.

INSERT 2

[SR 3.6.4.1.4 and] SR 3.6.4.1.5

The SGT System exhausts the [secondary] containment atmosphere to the environment through appropriate treatment equipment. Each SGT subsystem is designed to draw down pressure in the [secondary] containment to ≥[0.25] inches of vacuum water gauge in ≤ [120] seconds and maintain pressure in the [secondary] containment at ≥ [0.266] inches of vacuum water gauge for 1 hour at a flow rate ≤ [4000] cfm. To ensure that all fission products released to the [secondary] containment are treated, [SR 3.6.4.1.4 and] SR 3.6.4.1.5 verify that a pressure in the [secondary] containment that is less than the lowest postulated pressure external to the [secondary] containment boundary can [rapidly] be [established and] maintained. When the SGT System is operating as designed, the establishment and maintenance of [secondary] containment pressure cannot be accomplished if the [secondary] containment boundary is not intact. [Establishment of this pressure is confirmed by

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.1.4, which demonstrates that the [secondary] containment can be drawn down to ≥ [0.25] inches of vacuum water gauge in ≤ [120] seconds using one SGT subsystem.] SR 3.6.4.1.5 demonstrates that the pressure in the [secondary] containment can be maintained ≥ [0.266] inches of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate ≤ [4000] cfm. The 1 hour test period allows [secondary] containment to be in thermal equilibrium at steady state conditions. The primary purpose of these SR[s] is to ensure [secondary] containment boundary integrity. The secondary purpose of these SR[s] is to ensure that the SGT subsystem being tested functions as designed. There is a separate LCO with Surveillance Requirements which serves the primary purpose of ensuring OPERABILITY of the SGT System. These SR[s] need not be performed with each SGT subsystem. The SGT subsystem used for these Surveillance[s] is staggered to ensure that in addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. The inoperability of the SGT System does not necessarily constitute a failure of these Surveillance[s] relative to the [secondary] containment OPERABILITY. Operating experience has shown the [secondary] containment boundary usually passes these Surveillance[s] when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

REFERENCES

1. FSAR, Section [15.1.39].
2. FSAR, Section [15.1.41].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Required Action and associated Completion Time of Condition A or B not met during movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs. | D.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment. | Immediately |
| | AND | |
| | D.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.2.1 | ----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for SCIVs that are open under administrative controls. ---------- Verify each secondary containment isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | [31 days |
| SR 3.6.4.2.2 | Verify the isolation time of each power operated, automatic SCIV is within limits. | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.6.4.2.3 | Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving [recently] irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving fuel while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of [recently] irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

This SR verifies that each secondary containment manual isolation valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the [secondary] containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification that those SCIVs in [secondary] containment that are capable of being mispositioned are in the correct position.

Since these SCIVs are readily accessible to personnel during normal operation and verification of their position is relatively easy, the 31 day Frequency was chosen to provide added assurance that the SCIVs are in the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing. Insert 2

Two Notes have been added to this SR. The first Note applies to valves and blind flanges located in high radiation areas and allows them to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these SCIVs, once they have been verified to be in the proper position, is low.

A second Note has been included to clarify that SCIVs that are open under administrative controls are not required to meet the SR during the time the SCIVs are open.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.2.2

The isolation time is in accordance with the Inservice Testing Program.

Verifying that the isolation time of each power operated, automatic SCIV is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCIV will isolate in a time period less than or equal to that assumed in the safety analyses. The ~~isolation time and~~ Frequency of this SR ~~are~~ is [in accordance with the Inservice Testing Program or 92 days].

Insert 2

SR 3.6.4.2.3

Verifying that each automatic SCIV closes on a secondary containment isolation signal is required to prevent leakage of radioactive material from [secondary] containment following a DBA or other accidents. This SR ensures that each automatic SCIV will actuate to the isolation position on a [secondary] containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.6 overlaps this SR to provide complete testing of the safety function. 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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

REFERENCES

1. FSAR, Section [15.1.39].

2. FSAR, Section [15.1.41].

3. FSAR, Section [ ].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2.2 Initiate action to suspend OPDRVs. | Immediately |
| D. Two SGT subsystems inoperable in MODE 1, 2, or 3. | D.1 Enter LCO 3.0.3. | Immediately |
| E. Two SGT subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs. | E.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of [recently] irradiated fuel assemblies in [secondary] containment. | Immediately |
| | AND | |
| | E.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.3.1 | Operate each SGT subsystem for ≥ [10] continuous hours [with heaters operating]. | [31 days |
| SR 3.6.4.3.2 | Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP). | In accordance with the VFTP INSERT 1 |
| SR 3.6.4.3.3 | Verify each SGT subsystem actuates on an actual or simulated initiation signal. | [18] months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.3.4 | [ Verify each SGT filter cooler bypass damper can be opened and the fan started. | [[18] months] INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem for ≥ [10] continuous hours ensures that [both] subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation [with the heaters on (automatic heater cycling to maintain temperature)] for ≥ [10] continuous hours every 31 days eliminates moisture on the adsorbers and HEPA filters. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

INSERT 2

SR 3.6.4.3.3

This SR verifies that each SGT subsystem starts on receipt of an actual or simulated initiation signal. While this Surveillance can be performed with the reactor at power, operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.6 overlaps this SR to provide complete testing of the safety function. Therefore, the Frequency was found to be acceptable from a reliability standpoint.

[ SR 3.6.4.3.4

This SR verifies that the filter cooler bypass damper can be opened and the fan started. This ensures that the ventilation mode of SGT System operation is available. While this Surveillance can be performed with the reactor at power, operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was found to be acceptable from a reliability standpoint. ]

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Both RHRSW subsystems inoperable for reasons other than Condition B. | D.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.8 for [RHR shutdown cooling] made inoperable by RHRSW System. ---------- Restore one RHRSW subsystem to OPERABLE status. | [8] hours |
| E. Required Action and associated Completion Time not met. | E.1 Be in MODE 3. | 12 hours |
| | AND | |
| | E.2 Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

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

BASES

ACTIONS (continued)

E.1 and E.2

If the RHRSW subsystems cannot be not restored to OPERABLE status within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual, power operated, and automatic valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW System is a manually initiated system. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. INSERT 2

REFERENCES

1. FSAR, Section [9.2.7].
2. FSAR, Chapter [6].
3. FSAR, Chapter [15].
4. FSAR, Section [6.2.1.4.3].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. Required Action and associated Completion Time of Condition A, B [or D] not met.<br><br>OR<br><br>Both [PSW] subsystems inoperable for reasons other than Condition[s] B [and C].<br><br>[ OR<br><br>[UHS] inoperable for reasons other than Condition C [or D]. ] | F.1 Be in MODE 3.<br><br>AND<br><br>F.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.2.1 | [ Verify the water level of each [PSW] cooling tower basin is ≥ [ ] ft. | [24 hours ] |
| SR 3.7.2.2 | [ Verify the water level [in each PSW pump well of the intake structure] is ≥ [60.1] ft [mean sea level]. | [24 hours ] |
| SR 3.7.2.3 | [ Verify the average water temperature of [UHS] is ≤ [ ]°F. | [24 hours ] |
| SR 3.7.2.4 | [ Operate each [PSW] cooling tower fan for ≥ [15] minutes. | [31 days ] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.2.5 | ----------NOTE----------<br>Isolation of flow to individual components does not render [PSW] System inoperable.<br>----------<br><br>Verify each [PSW] subsystem manual, power operated, and automatic valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days<br><br>INSERT 1 |
| SR 3.7.2.6 | Verify each [PSW] subsystem actuates on an actual or simulated initiation signal. | [18] months |

BASES

ACTIONS (continued)

F.1 and F.2

If the [PSW] subsystem cannot be restored to OPERABLE status within the associated Completion Time, or both [PSW] subsystems are inoperable for reasons other than Condition B and [Condition C], [or the [UHS] is determined inoperable for reasons other than Condition C or D] the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

[ SR 3.7.2.1

This SR ensures adequate long term (30 days) cooling can be maintained. With the [UHS] water source below the minimum level, the affected [PSW] subsystem must be declared inoperable. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. ]

[ SR 3.7.2.2

This SR verifies the water level [in each pump well of the intake structure] to be sufficient for the proper operation of the [PSW] pumps (net positive suction head and pump vortexing are considered in determining this limit). The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. ]

INSERT 2

[ SR 3.7.2.3

Verification of the [UHS] temperature ensures that the heat removal capability of the [PSW] System is within the assumptions of the DBA analysis. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. ]

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.7.2.4

Operating each cooling tower fan for ≥ 15 minutes ensures that all fans are OPERABLE and that all associated controls are functioning properly. It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. The 31 day Frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the cooling tower fans occurring between surveillances. ]

SR 3.7.2.5

INSERT 2

Verifying the correct alignment for each manual, power operated, and automatic valve in each [PSW] subsystem flow path provides assurance that the proper flow paths will exist for [PSW] operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet considered in the correct position, provided it can be automatically realigned to its accident position within the required time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This SR is modified by a Note indicating that isolation of the [PSW] System to components or systems may render those components or systems inoperable, but does not affect the OPERABILITY of the [PSW] System. As such, when all [PSW] pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the [PSW] System is still OPERABLE.

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

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.6

This SR verifies that the automatic isolation valves of the [PSW] System will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident event. This is demonstrated by the use of an actual or simulated initiation signal. This SR also verifies the automatic start capability of one of the two [PSW] pumps in each subsystem.

Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. FSAR, Chapter [4].
2. FSAR, Chapter [6].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.3.1 | Verify each DG [1B] SSW System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.7.3.2 | Verify the DG [1B] SSW System pump starts automatically when DG [1B] starts and energizes the respective bus. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

allowed to be in the nonaccident position, and yet be considered in the correct position provided it can be automatically realigned to its accident position, within the required time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

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

INSERT 2

SR 3.7.3.2

This SR ensures that the DG [1B] SSW System pump will automatically start to provide required cooling to the DG [1B] when the DG [1B] starts and the respective bus is energized.

Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency, which is based at the refueling cycle. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [9.5.5].
2. FSAR, Chapter [6].
3. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. Two [MCREC] subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs. | ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- | |
| | F.1 Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment. | Immediately |
| | AND | |
| | F.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.4.1 | Operate each [MCREC] subsystem for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes]. | [31 days |
| SR 3.7.4.2 | Perform required [MCREC] filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)]. | In accordance with the [VFTP] INSERT 1 |
| SR 3.7.4.3 | Verify each [MCREC] subsystem actuates on an actual or simulated initiation signal. | [[18] months |
| SR 3.7.4.4 | [ Verify each [MCREC] subsystem can maintain a positive pressure of ≥ [0.1] inches water gauge relative to the [turbine building] during the [pressurization] mode of operation at a flow rate of ≤ [400] cfm. | [18] months on a STAGGERED TEST BASIS ] |

BASES

ACTIONS (continued)

During movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs, with two [MCREC] subsystems inoperable, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, movement of [recently] irradiated fuel assemblies in the [secondary] containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. If applicable, actions must be initiated immediately to suspend OPDVRs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

This SR verifies that a subsystem in a standby mode starts on demand and continues to operate. Standby systems should be checked periodically to ensure that they start and function properly. As the environmental and normal operating conditions of this system are not severe, testing each subsystem once every month provides an adequate check on this system. Monthly heater operation dries out any moisture that has accumulated in the charcoal as a result of humidity in the ambient air. [Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.] [Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.

INSERT 2

SR 3.7.4.2

This SR verifies that the required [MCREC] testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The [VFTP] includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the [VFTP].

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.4.3

This SR verifies that on an actual or simulated initiation signal, each [MCREC] subsystem starts and operates. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.5 overlaps this SR to provide complete testing of the safety function. [The [18] month Frequency is specified in Reference 5.

INSERT 2

[ SR 3.7.4.4

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas (the turbine building), is periodically tested to verify proper function of the [MCREC] System. During the emergency mode of operation, the [MCREC] System is designed to slightly pressurize the control room ≥ [0.1] inches water gauge positive pressure with respect to the turbine building to prevent unfiltered inleakage. The [MCREC] System is designed to maintain this positive pressure at a flow rate of ≤ [400] cfm to the control room in the pressurization mode. [The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with industry practice and other filtration systems SRs. ]

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [9].
3. FSAR, Chapter [15].
4. FSAR, Section [6.4.1.2.2].
5. Regulatory Guide 1.52, Rev. [2].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment.<br><br>AND<br><br>C.2.2 Initiate action to suspend OPDRVs. | Immediately<br><br><br><br><br>Immediately |
| D. Two [control room AC] subsystems inoperable in MODE 1, 2, or 3. | D.1 Enter LCO 3.0.3. | Immediately |
| E. Two [control room AC] subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs. | ----------NOTE----------<br>LCO 3.0.3 is not applicable.<br>----------<br><br>E.1 Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment.<br><br>AND<br><br>E.2 Initiate actions to suspend OPDRVs. | <br><br><br><br>Immediately<br><br><br><br><br>Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.5.1 | Verify each [control room AC] subsystem has the capability to remove the assumed heat load. | [18] months INSERT 1 |

BASES

ACTIONS (continued)

D.1

If both [control room AC] subsystems are inoperable in MODE 1, 2, or 3, the [Control Room AC] System may not be capable of performing the intended function. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

The Required Actions of Condition E are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs, with two [control room AC] subsystems inoperable, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, handling of [recently] irradiated fuel in the [secondary] containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load assumed in the [safety analyses]. The SR consists of a combination of testing and calculation. [The [18] month Frequency is appropriate since significant degradation of the [Control Room AC] System is not expected over this time period. INSERT 2

REFERENCES

1. FSAR, Section [6.4].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.6.1 | ----------NOTE----------<br>Not required to be performed until 31 days after any [main steam line not isolated and] SJAE in operation.<br>----------<br><br>Verify the gross gamma activity rate of the noble gases is ≤ [240] mCi/second [after decay of 30 minutes]. | [31 days INSERT 1<br><br>AND<br><br>Once within 4 hours after a ≥ 50% increase in the nominal steady state fission gas release after factoring out increases due to changes in THERMAL POWER level |

BASES

ACTIONS

A.1

If the offgas radioactivity rate limit is exceeded, 72 hours is allowed to restore the gross gamma activity rate to within the limit. The 72 hour Completion Time is reasonable, based on engineering judgment, the time required to complete the Required Action, the large margins associated with permissible dose and exposure limits, and the low probability of a Main Condenser Offgas System rupture.

B.1, B.2, B.3.1, and B.3.2

If the gross gamma activity rate is not restored to within the limits in the associated Completion Time, [all main steam lines or] the SJAE must be isolated. This isolates the Main Condenser Offgas System from the source of the radioactive steam. The main steam lines are considered isolated if at least one main steam isolation valve in each main steam line is closed, and at least one main steam line drain valve in each drain line is closed. The 12 hour Completion Time is reasonable, based on operating experience, to perform the actions from full power conditions in an orderly manner and without challenging unit systems.

An alternative to Required Actions B.1 and B.2 is to place the unit in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

This SR, on a 31 day Frequency, requires an isotopic analysis of an offgas sample to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-135, Xe-138, Kr-85, Kr-87, and Kr-88. If the measured rate of radioactivity increases significantly (by ≥ 50% after correcting for expected increases due to changes in THERMAL POWER), an isotopic analysis is also performed within 4 hours after the increase is noted, to ensure that the increase is not indicative of a sustained increase in the radioactivity rate. The 31 day Frequency is adequate in view of other instrumentation that continuously monitor the offgas, and is acceptable, based on operating experience.

INSERT 2

This SR is modified by a Note indicating that the SR is not required to be performed until 31 days after any [main steam line is not isolated and] the SJAE is in operation. Only in this condition can radioactive fission gases be in the Main Condenser Offgas System at significant rates.

## 3.7 PLANT SYSTEMS

### 3.7.7 The Main Turbine Bypass System

LCO 3.7.7 The Main Turbine Bypass System shall be OPERABLE.

OR

The following limits are made applicable:

[ a. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," limits for an inoperable Main Turbine Bypass System, as specified in the [COLR]; and ]

[ b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for an inoperable Main Turbine Bypass System, as specified in the [COLR]. ]

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. [Requirements of the LCO not met or Main Turbine Bypass System inoperable]. | A.1 [Satisfy the requirements of the LCO or restore Main Turbine Bypass System to OPERABLE status]. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.7.1 | Verify one complete cycle of each main turbine bypass valve. | [31 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.7.2 | Perform a system functional test. | [18] months |
| SR 3.7.7.3 | Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

Cycling each main turbine bypass valve through one complete cycle of full travel demonstrates that the valves are mechanically OPERABLE and will function when required. The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Operating experience has shown that these components usually pass the SR when performed at the 31 day Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.7.2

The Main Turbine Bypass System is required to actuate automatically to perform its design function. This SR demonstrates that, with the required system initiation signals, the valves will actuate to their required position. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the [18] month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.

INSERT 2

SR 3.7.7.3

This SR ensures that the TURBINE BYPASS SYSTEM RESPONSE TIME is in compliance with the assumptions of the appropriate safety analysis. The response time limits are specified in [unit specific documentation]. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the [18] month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [7.7.4].
2. FSAR, Section [15.1.1].

## 3.7 PLANT SYSTEMS

### 3.7.8 Spent Fuel Storage Pool Water Level

LCO 3.7.8 The spent fuel storage pool water level shall be ≥ [23] ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the spent fuel storage pool.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.8.1 | Verify the spent fuel storage pool water level is ≥ [23] ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks. | [7 days INSERT 1 |

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

When the initial conditions for an accident cannot be met, action must be taken to preclude the accident from occurring. If the spent fuel storage pool level is less than required, the movement of irradiated fuel assemblies in the spent fuel storage pool is suspended immediately. Suspension of this activity shall not preclude completion of movement of an irradiated fuel assembly to a safe position. This effectively precludes a spent fuel handling accident from occurring.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR verifies that sufficient water is available in the event of a fuel handling accident. The water level in the spent fuel storage pool must be checked periodically. The 7 day Frequency is acceptable, based on operating experience, considering that the water volume in the pool is normally stable, and all water level changes are controlled by unit procedures. INSERT 2

REFERENCES

1. FSAR, Section [ ].
2. FSAR, Section [15.1.4].
3. NUREG-0800, Section 15.7.4, Revision 1, July 1981.
4. 10 CFR 100.
5. Regulatory Guide 1.25, March 1972.
6. FSAR, Section [9.1.2.2.2].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. [ One [required] [automatic load sequencer] inoperable. | ----------REVIEWER'S NOTE---------- This Condition may be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads following a loss of offsite power independent of, or coincident with, a Design Basis Event. ---------- | |
| | F.1 Restore [required] [automatic load sequencer] to OPERABLE status. | [12] hours ] |
| G. Required Action and associated Completion Time of Condition A, B, C, D, E, or [F] not met. | G.1 Be in MODE 3. | 12 hours |
| | AND | |
| | G.2 Be in MODE 4. | 36 hours |
| H. Three or more [required] AC sources inoperable [for reasons other than Condition E]. | H.1 Enter LCO 3.0.3. | 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 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.2 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.<br><br>[ 2. 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. ]<br>----------<br><br>Verify each DG starts from standby conditions and achieves steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | [31 days |
| SR 3.8.1.3 | ----------NOTES----------<br>1. DG loadings may include gradual loading as recommended by the manufacturer.<br><br>2. Momentary transients outside the load range do not invalidate this test.<br><br>3. This Surveillance shall be conducted on only one DG at a time.<br><br>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.<br>----------<br><br>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ [1710] kW and ≤ [2000] kW. | INSERT 1<br>[31 days |
| SR 3.8.1.4 | Verify each day tank [and engine mounted tank] contain[s] ≥ [900] gal of fuel oil. | [31 days |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.5 | Check for and remove accumulated water from each day tank [and engine mounted tank]. | [31] days |
| SR 3.8.1.6 | Verify the fuel oil transfer system operates to [automatically] transfer fuel oil from storage tank[s] to the day tank [and engine mounted tank]. | [92] days |
| SR 3.8.1.7 | ----------NOTE----------<br>All DG starts may be preceded by an engine prelube period.<br>----------<br><br>Verify each DG starts from standby condition and achieves:<br><br>a. In ≤ [12] seconds, voltage ≥ [3740] V and frequency ≥ [58.8] Hz and<br><br>b. Steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | INSERT 1<br><br>[184 days |
| SR 3.8.1.8 | ----------NOTE----------<br>[ 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. Credit may be taken for unplanned events that satisfy this SR. ]<br>----------<br><br>[ Verify [automatic [and] manual] transfer of [unit power supply] from the [normal offsite circuit to the alternate] offsite circuit. | [18] months ] |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.9 | ----------NOTES----------<br>[ 1. 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. Credit may be taken for unplanned events that satisfy this SR.<br><br>2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ]<br>---------- | |
| | Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:<br><br>a. Following load rejection, the frequency is ≤ [65.5] Hz,<br><br>b. Within [3] seconds following load rejection, the voltage is ≥ [3740] V and ≤ [4580] V, and<br><br>[ c. Within [6] seconds following load rejection, the frequency is ≥ [58.8] Hz and ≤ [61.2] Hz. ] | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.10 | ----------NOTES----------<br>[1. 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. Credit may be taken for unplanned events that satisfy this SR.<br><br>2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ]<br>---------- | |
| | Verify each DG does not trip and voltage is maintained ≤ [4800] V during and following a load rejection of ≥ [1710] kW and ≤ [2000] kW. | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.11 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br><br>2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify on an actual or simulated loss of offsite power signal:<br><br>a. De-energization of emergency buses,<br><br>b. Load shedding from emergency buses, and<br><br>c. DG auto-starts from standby condition and:<br><br>1. Energizes permanently connected loads in ≤ [12] seconds,<br><br>2. Energizes auto-connected shutdown loads through [automatic load sequencer],<br><br>3. Maintains steady state voltage ≥ [3740] V and ≤ [4580] V,<br><br>4. Maintains steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and<br><br>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 | ----------NOTES----------<br>1. [ All DG starts may be preceded by an engine prelube period.<br><br>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. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and:<br><br>a. In ≤ [12] seconds after auto-start and during tests, achieves voltage ≥ [3740] V and frequency ≥ [58.8] Hz,<br><br>b. Achieves steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz,<br><br>c. Operates for ≥ [5] minutes,<br><br>d. Permanently connected loads remain energized from the offsite power system, and<br><br>e. Emergency loads are energized [or auto-connected through the automatic load sequencer] from the offsite power system. | [[18] months] INST 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.13 | ----------NOTE----------<br>[ This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ]<br>----------<br><br>Verify each DG's automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ECCS initiation signal] except:<br><br>a. Engine overspeed,<br><br>b. Generator differential current,<br><br>[ c. Low lube oil pressure,<br><br>d. High crankcase pressure, and<br><br>e. Start failure relay. ] | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.14 | ----------NOTES----------<br>1. Momentary transients outside the load and power factor ranges do not invalidate this test.<br><br>2. 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. Credit may be taken for unplanned events that satisfy this SR.<br><br>3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.<br>---------- | |
| | Verify each DG operates for ≥ 24 hours:<br><br>a. For ≥ [2] hours loaded ≥ [3100] kW and ≤ [3400] kW and<br><br>b. For the remaining hours of the test loaded ≥ [2850] kW and ≤ [3150] kW. | [18] months<br>INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.15 | ----------NOTES----------<br>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ [2] hours loaded ≥ [1710] kW and ≤ [2000] kW.<br><br>Momentary transients outside of load range do not invalidate this test.<br><br>2. All DG starts may be preceded by an engine prelube period.<br>----------<br><br>Verify each DG starts and achieves:<br><br>a. In ≤ [12] seconds, voltage ≥ [3740] V and frequency ≥ [58.8] Hz and<br><br>b. Steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | [18] months<br><br>INSERT 1 |
| SR 3.8.1.16 | ----------NOTE----------<br>This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify each DG:<br><br>a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power,<br><br>b. Transfers loads to offsite power source, and<br><br>c. Returns to ready-to-load operation. | [18] months |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.17 | ----------NOTE----------<br>[ This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by:<br><br>a. Returning DG to ready-to-load operation and<br><br>[ b. Automatically energizing the emergency load from offsite power. ] | [[18] months ]<br><br>INSERT 1 |
| SR 3.8.1.18 | ----------NOTE----------<br>[ This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ]<br>----------<br><br>[ Verify interval between each sequenced load block is within ± [10% of design interval] [for each load sequencer timer ]. | [[18] months ] |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.19 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br><br>2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:<br><br>a. De-energization of emergency buses,<br><br>b. Load shedding from emergency buses, and<br><br>c. DG auto-starts from standby condition and:<br><br>1. Energizes permanently connected loads in ≤ [12] seconds,<br><br>2. Energizes auto-connected emergency loads through [load sequencer],<br><br>3. Achieves steady state voltage ≥ [3740] V and ≤ [4580] V,<br><br>4. Achieves steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and<br><br>5. Supplies permanently connected and auto-connected emergency loads for ≥ [5] minutes. | [18] months<br>INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.20 | ----------NOTE----------<br>All DG starts may be preceded by an engine prelube period.<br>----------<br><br>Verify, when started simultaneously from standby condition, [each] [2A and 2C] DG achieves:<br><br>a. In ≤ [12] seconds, voltage ≥ [3740] V and frequency ≥ [58.8] Hz and<br><br>b. Steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | 10 years<br>INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS (continued)

Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of [3740] V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1 (Ref. 11), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of [4576] V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. 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 found 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 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.

INSERT 2

SR 3.8.1.2 and SR 3.8.1.7

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and 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 SRs have been modified by a Note (Note 1 for SR 3.8.1.2 and Note for SR 3.8.1.7) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup prior to loading.

BASES

SURVEILLANCE REQUIREMENTS (continued)

For the purposes of this testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

[ In order to reduce stress and wear on diesel engines, some manufacturers recommend 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 2, which is only applicable when such modified start procedures are recommended by the manufacturer. ]

SR 3.8.1.7 requires that, at a ~~184 day Frequency,~~ the DG starts from standby conditions and achieves required voltage and frequency within 12 seconds. The 12 second start requirement supports the assumptions in the design basis LOCA analysis of FSAR, Section [6.3] (Ref. 12). The 12 second start requirement is not applicable to SR 3.8.1.2 (see Note 2 of SR 3.8.1.2), when a modified start procedure as described above is used. If a modified start is not used, the 12 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 does require a 12 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.

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

The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). 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 2

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing and accepting 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 [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).

Note 1 modifies this Surveillance to indicate that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized.

Note 2 modifies this Surveillance by stating that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test.

Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations.

Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

INSERT 2

This SR provides verification that the level of fuel oil in the day tank [and engine mounted tank] is at or above the level at which fuel oil is automatically added. 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%.

The 31 day Frequency is adequate to ensure 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.5

Periodic

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 [and engine mounted] 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 preventive maintenance. The presence of water does not necessarily represent a failure of this SR provided that accumulated water is removed during performance of this Surveillance.

INSERT 2

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. It is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

[ The Frequency for this SR is variable, depending on individual system design, with up to a [92] day interval. The [92] day Frequency corresponds to the testing requirements for pumps as contained in the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 13); however, the design of fuel transfer systems is such that pumps operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs. ]

SR 3.8.1.7

See SR 3.8.1.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.8.1.8

Transfer of each 4.16 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 plant 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 on the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.] INSERT 2

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, plant 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. Credit may be taken for unplanned events that satisfy this SR.

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 largest single load for each DG is a residual heat removal service water pump (1225 bhp). This Surveillance may be accomplished by either:

BASES

SURVEILLANCE REQUIREMENTS (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. 14), 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. For DGs 2A, 2C, and 1B, this represents 65.5 Hz, equivalent to 75% of the difference between nominal speed and the overspeed trip setpoint.

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 [6] seconds specified is equal to 60% of the 10 second load sequence interval associated with sequencing the residual heat removal (RHR) pumps during an undervoltage on the bus concurrent with a LOCA. 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 and SR 3.8.1.9.c are steady state voltage and frequency values 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). Insert 2

This SR is modified by two Notes. The reason for Note 1 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, plant 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

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 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.

The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9) and is intended to be consistent with expected fuel cycle lengths.

INSERT 2

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that would challenge continued steady state operation and, as a result, plant 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. Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite

BASES

SURVEILLANCE REQUIREMENTS (continued)

The DG auto-start time of 12 seconds is derived from requirements of the accident analysis for responding 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 has been achieved.

The requirement to verify the connection and power supply of permanent and auto-connected 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 systems are not capable of being operated at full flow, or 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 the connection and loading of these loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

INSERT 2

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 shall be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 this assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.12

[ This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time ([12] seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ [5] minutes. The [5] minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on a LOCA signal without loss of offsite power.

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 loading logic for loading onto offsite power. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, high pressure injection systems are not capable of being operated at full flow, or 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 the connection and loading of these loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of [18 months] takes into consideration plant 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 is acceptable from a reliability standpoint.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

The [18 month] Frequency is based on engineering judgment, takes into consideration plant 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.

INSERT 2

The SR is modified by a Note. The reason for the Note is that ~~performing~~ the Surveillance would remove a required DG from service. 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. Credit may be taken for unplanned events that satisfy this SR.

----------REVIEWER'S NOTE----------

The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(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 - 22 hours of which is at a load equivalent to the continuous rating of the DG, and 2 hours of which is at a load equivalent to 110% of the continuous duty rating of the DG. Plant Hatch has taken an exception to this requirement and performs the 2 hour run at the 2000 hour rating (3100 kW). The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

A load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

INSERT 2

This Surveillance has been modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that would challenge continued steady state operation and, as a result, plant 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Credit may be taken for unplanned events that satisfy this SR. Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ [0.9]. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 3 allows the surveillance to be conducted at a power factor other than ≤ [0.9]. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ [0.9] results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to [0.9] while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of [0.9] may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to [0.9] without exceeding the DG excitation limits.

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 [12] seconds. The [12] 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 1.108 (Ref. 9), paragraph 2.a.(5).

INSERT 2

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

recommendations for achieving hot conditions. 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. 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 1.108 (Ref. 9), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and that the DG can be returned to ready-to-load status when offsite power is restored. It also ensures that the auto-start 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 auto-close signal on bus undervoltage, and the load sequence timers are reset.

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 plant conditions required to perform the Surveillance.

INSERT 2

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 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. Credit may be taken for unplanned events that satisfy this SR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions is not compromised as the result of testing. Interlocks to the LOCA sensing circuits cause the DG to automatically reset to ready-to-load operation if an ECCS initiation 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 required by IEEE-308 (Ref. 14), paragraph 6.2.6(2).

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.12. The intent in the requirements associated with SR 3.8.1.17.b is to show that the emergency loading is 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 [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(8); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths. INSERT 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.18

Under accident conditions [and loss of offsite power] 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 Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(2); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

INSERT 2

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 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. Credit may be taken for unplanned events that satisfy this SR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

----------REVIEWER'S NOTE----------
The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

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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 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 ECCS initiation 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 Frequency of [18 months] takes into consideration plant conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of [18 months].

INSERT 2

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, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Credit may be taken for unplanned events that satisfy this SR.

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 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 2

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, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. One or more DGs with starting air receiver pressure < [225] psig and ≥ [125] psig. | E.1 Restore starting air receiver pressure to ≥ [225] psig. | 48 hours |
| F. Required Action and associated Completion Time not met.<br><br>OR<br><br>One or more DGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E. | F.1 Declare associated DG inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.3.1 | Verify each fuel oil storage tank contains ≥ [33,000] gal of fuel. | [31 days |
| SR 3.8.3.2 | Verify lube oil inventory is ≥ [500] gal. | [31 days |
| SR 3.8.3.3 | Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program. | In accordance with the Diesel Fuel Oil Testing Program |
| SR 3.8.3.4 | Verify each DG air start receiver pressure is ≥ [225] psig. | [31 days |

INDEX 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.3.5 | Check for and remove accumulated water from each fuel oil storage tank. | [31] days INSERT 1 |

BASES

ACTIONS (continued)

F.1

With a Required Action and associated Completion Time not met, or the stored diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through E, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at full load. The 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.

INSERT 2

SR 3.8.3.2

This Surveillance ensures that sufficient lubricating oil inventory is available to support at least 7 days of full load operation for each DG. The [500] gal requirement is based on the DG manufacturer's consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer's recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the plant staff.

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. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for

BASES

SURVEILLANCE REQUIREMENTS (continued)

Particulate concentrations should be determined in accordance with ASTM D5452-[ ] (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 volume of stored fuel oil 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 system 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 the [five] starts can be accomplished.

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.

INSERT 2

SR 3.8.3.5

Periodic

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, contaminated fuel oil, and from breakdown of the fuel oil by

BASES

SURVEILLANCE REQUIREMENTS (continued)

bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 2). This SR is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during performance of the Surveillance. Insert 2

REFERENCES

1. FSAR, Section [9.5.2].
2. Regulatory Guide 1.137.
3. ANSI N195, 1976.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. ASTM Standards: D4057-[ ]; D975-[ ]; D1298-[ ]; D4176-[ ]; [D2709-[ ];] D1552-[ ]; D2622-[ ]; D4294-[ ]; D5452-[ ].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Required Action and Associated Completion Time of Condition A[, B, or C] not met for station service DC subsystem. | D.1 Be in MODE 3.<br><br>AND<br><br>D.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |
| E. [ Required Action and associated Completion Time of Condition A[, B, or C] not met for DG DC subsystem. | E.1 Declare associated DG inoperable. | Immediately ] |

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 required battery charger supplies ≥ [400 amps for station service subsystems, and ≥ 100 amps for DG subsystems] at greater than or equal to the minimum established float voltage for ≥ [4] hours.<br><br>OR<br><br>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----------<br>1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3.<br><br>2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | 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<br>INSERT 1 |

BASES

ACTIONS (continued)

E.1

If the DG DC electrical power subsystem cannot be restored to OPERABLE status in the associated Completion Time, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions for an inoperable DG, LCO 3.8.1, "AC Sources - Operating."

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 is supplying the 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 ([2.20] Vpc or [127.6] 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 2

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR provides two options. One option requires that each battery charger be capable of supplying [400] amps at the minimum established float voltage for [8] hours. The ampere requirements are 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 coincident 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 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.

INSERT 2

SR 3.8.4.3

A battery service test is a special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 4.

The Frequency of [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.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.<br><br>OR<br><br>One [or two] batter[y][ies on one division] with one or more battery cells float voltage < [2.07] V and float current > [2] amps. | F.1 Declare associated battery inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.6.1 | ----------NOTE----------<br>Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1.<br>----------<br><br>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 |
| SR 3.8.6.3 | Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits. | [31 days |
| SR 3.8.6.4 | Verify each battery pilot cell temperature is greater than or equal to minimum established design limits. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.6.5 | Verify each battery connected cell voltage is ≥ [2.07] V. | [92 days<br>INSERT 1 |
| SR 3.8.6.6 | ----------NOTE----------<br>This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portion of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. | [60 months<br>AND<br>12 months when battery shows degradation, or has reached [85]% of the expected life with capacity < 100% of manufacturer's rating<br>AND<br>24 months when battery has reached [85]% of the expected life with capacity ≥ 100% of manufacturer's rating |

BASES

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 the 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. 1). [The 7 day Frequency is consistent with IEEE-450 (Ref. 1).

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

INSERT 2

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 [130.5] V at the battery terminals, or [2.25] Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than [2.07] Vpc, are addressed in Specification 5.5.14. 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. 1).

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. 1).

BASES

SURVEILLANCE REQUIREMENTS (continued)

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., [40]°F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provided 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. 1).

INSERT 2

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 discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test.

It may consist of just two rates; for instance, the one minute rate 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 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 1) 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 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 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to IEEE-450 (Ref. 3), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is 10% below the manufacturer's rating. All these Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1).

INSERT 2

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DC electrical power subsystem 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. Credit may be taken for unplanned events that satisfy this Surveillance.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.7.1 | Verify correct inverter voltage, [frequency,] and alignment to required AC vital buses. | [7 days INSERT 1 |

BASES

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 and frequency output ensures that the required power is readily available for 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 2

REFERENCES

1. FSAR, Chapter [8].
2. FSAR, Chapter [6].
3. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2.2 Suspend handling of [recently] irradiated fuel assemblies in the [secondary] containment. | Immediately |
| | AND | |
| | A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel. | Immediately |
| | AND | |
| | A.2.4 Initiate action to restore [required] inverters to OPERABLE status. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.8.1 | Verify correct inverter voltage, [frequency,] and alignments to [required] AC vital buses. | [7 days] INSERT 1 |

BASES

ACTIONS (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverter[s] and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the plant 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 plant 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 and frequency output ensures that the required power is readily 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 2

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. One or more [station service] DC electrical power distribution subsystems inoperable. | C.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status. | 2 hours<br><br>AND<br><br>16 hours from discovery of failure to meet LCO |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Be in MODE 3.<br><br>AND<br><br>D.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |
| E. [ One or more DG DC electrical power distribution subsystems inoperable. | E.1 Declare associated DG(s) inoperable. | Immediately ] |
| F. Two or more electrical power distribution subsystems inoperable that result in a loss of function. | F.1 Enter LCO 3.0.3. | Immediately |

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 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the AC and DC, 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 buses are 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 2

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].
3. Regulatory Guide 1.93, December 1974.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel. | Immediately |
| | AND | |
| | 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 shutdown cooling 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 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC vital bus electrical power distribution subsystem is functioning properly, with the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, as well as other indications available in the control room that alert the operator to subsystem malfunctions. INSERT 2

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].

SURVEILLANCE REQUIREMENTS

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel. INSERT 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section [7.6.1].
3. FSAR, Section [15.1.13].
4. FSAR, Section [15.1.14].

## 3.9 REFUELING OPERATIONS

### 3.9.2 Refuel Position One-Rod-Out Interlock

LCO 3.9.2 The refuel position one-rod-out interlock shall be OPERABLE.

APPLICABILITY: MODE 5 with the reactor mode switch in the refuel position and any control rod withdrawn.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Refuel position one-rod-out interlock inoperable. | A.1 Suspend control rod withdrawal. | Immediately |
| | AND | |
| | A.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

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

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of 12 hours is sufficient in view of other administrative controls utilized during refueling operations to ensure safe operation.

INSERT 2

SR 3.9.2.2

Performance of a CHANNEL FUNCTIONAL TEST on each channel demonstrates the associated refuel position one-rod-out interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. The 7 day Frequency is considered adequate because of demonstrated circuit reliability, procedural controls on control rod withdrawals, and visual and audible indications available in the control room to alert the operator to control rods not fully inserted. To perform the required testing, the applicable condition must be entered (i.e., a control rod must be withdrawn from its full-in position). Therefore, SR 3.9.2.2 has been modified by a Note that states the CHANNEL FUNCTIONAL TEST is not required to be performed until 1 hour after any control rod is withdrawn.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.

2. FSAR, Section [7.6.1.1].

3. FSAR, Section [15.4.1.1].

## 3.9 REFUELING OPERATIONS

### 3.9.3 Control Rod Position

LCO 3.9.3 All control rods shall be fully inserted.

APPLICABILITY: When loading fuel assemblies into the core.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more control rods not fully inserted. | A.1 Suspend loading fuel assemblies into the core. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.3.1 | Verify all control rods are fully inserted. | 12 hours INSERT 1 |

BASES

APPLICABILITY

During MODE 5, loading fuel into core cells with control rods withdrawn may result in inadvertent criticality. Therefore, the control rods must be inserted before loading fuel into a core cell. All control rods must be inserted before loading fuel to ensure that a fuel loading error does not result in loading fuel into a core cell with the control rod withdrawn.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and no fuel loading activities are possible. Therefore, this Specification is not applicable in these MODES.

ACTIONS

A.1

With all control rods not fully inserted during the applicable conditions, an inadvertent criticality could occur that is not analyzed in the FSAR. All fuel loading operations must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

During refueling, to ensure that the reactor remains subcritical, all control rods must be fully inserted prior to and during fuel loading. Periodic checks of the control rod position ensure this condition is maintained.

The 12 hour Frequency takes into consideration the procedural controls on control rod movement during refueling as well as the redundant functions of the refueling interlocks. INSERT 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section [15.1.13].
3. FSAR, Section [15.1.14].

## 3.9 REFUELING OPERATIONS

### 3.9.5 Control Rod OPERABILITY - Refueling

LCO 3.9.5 Each withdrawn control rod shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more withdrawn control rods inoperable. | A.1 Initiate action to fully insert inoperable withdrawn control rods. | Immediately |

SURVEILLANCE REQUIREMENTS

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

BASES

APPLICABILITY (continued)

For MODES 1 and 2, control rod requirements are found in LCO 3.1.2, "Reactivity Anomalies," LCO 3.1.3, "Control Rod OPERABILITY," LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators." During MODES 3 and 4, control rods are not able to be withdrawn since the reactor mode switch is in shutdown and a control rod block is applied. This provides adequate requirements for control rod OPERABILITY during these conditions.

ACTIONS

A.1

With one or more withdrawn control rods inoperable, action must be immediately initiated to fully insert the inoperable control rod(s). Inserting the control rod(s) ensures the shutdown and scram capabilities are not adversely affected. Actions must continue until the inoperable control rod(s) is fully inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2

During MODE 5, the OPERABILITY of control rods is primarily required to ensure a withdrawn control rod will automatically insert if a signal requiring a reactor shutdown occurs. Because no explicit analysis exists for automatic shutdown during refueling, the shutdown function is satisfied if the withdrawn control rod is capable of automatic insertion and the associated CRD scram accumulator pressure is ≥ [940] psig.

The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.

INSERT 2

SR 3.9.5.1 is modified by a Note that allows 7 days after withdrawal of the control rod to perform the Surveillance. This acknowledges that the control rod must first be withdrawn before performance of the Surveillance, and therefore avoids potential conflicts with SR 3.0.3 and SR 3.0.4.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section [15.1.13].
3. FSAR, Section [15.1.14].

## 3.9 REFUELING OPERATIONS

### 3.9.6 [Reactor Pressure Vessel (RPV)] Water Level - [Irradiated Fuel]

LCO 3.9.6 [RPV] water level shall be ≥ [23] ft above the top of the [RPV flange].

APPLICABILITY: During movement of irradiated fuel assemblies within the [RPV],
[ During movement of new fuel assemblies or handling of control rods within the [RPV], when irradiated fuel assemblies are seated within the [RPV]. ]

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. [RPV] water level not within limit. | A.1 Suspend movement of fuel assemblies [and handling of control rods] within the [RPV]. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.6.1 | Verify [RPV] water level is ≥ [23] ft above the top of the [RPV flange]. | [24 hours INSERT 1 |

BASES

LCO

A minimum water level of [23] ft above the top of the RPV flange is required to ensure that the radiological consequences of a postulated fuel handling accident are within acceptable limits, as provided by the guidance of Reference 3.

APPLICABILITY

LCO 3.9.6 is applicable when moving [irradiated] fuel assemblies [or handling control rods (i.e., movement with other than the normal control rod drive)] within the RPV. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. [If irradiated fuel is not present within the RPV, there can be no significant radioactivity release as a result of a postulated fuel handling accident.] Requirements for handling of new fuel assemblies or control rods (where water depth to the RPV flange is not of concern) are covered by LCO 3.9.7, "RPV Water Level - New Fuel or Control Rods." Requirements for fuel handling accidents in the spent fuel storage pool are covered by LCO 3.7.8, "Spent Fuel Storage Pool Water Level."

----------REVIEWER'S NOTE----------

LCO 3.9.6 is written to cover new fuel and control rods as well as irradiated fuel. If a plant adopts LCO 3.9.7, however, the second bracketed portion of this Applicability is adopted in lieu of the first bracketed portion, and the LCO name and Required Action A.1 modified appropriately.

---

ACTIONS

A.1

If the water level is < [23] ft above the top of the RPV flange, all operations involving movement of [irradiated] fuel assemblies [and handling of control rods] within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of [irradiated] fuel movement [and control rod handling] shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of [23] ft above the top of the RPV flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely.

INSERT 2

## 3.9 REFUELING OPERATIONS

### 3.9.7 [ Reactor Pressure Vessel (RPV)] Water Level - [New Fuel or Control Rods ]

LCO 3.9.7 [RPV] water level shall be ≥ [23] ft above the top of irradiated fuel assemblies seated within the [RPV].

APPLICABILITY: During movement of new fuel assemblies or handling of control rods within the [RPV], when irradiated fuel assemblies are seated within the [RPV].

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. [RPV] water level not within limit. | A.1 | Suspend movement of fuel assemblies and handling of control rods within the [RPV]. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.7.1 | Verify [RPV] water level is ≥ [23] ft above the top of irradiated fuel assemblies seated within the [RPV]. | [24 hours INSERT 1 |

BASES

APPLICABILITY

LCO 3.9.7 is applicable when moving new fuel assemblies or handling control rods (i.e., movement with other than the normal control rod drive) over irradiated fuel assemblies seated within the RPV. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present within the RPV, 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 storage pool are covered by LCO 3.7.8, "Spent Fuel Storage Pool Water Level." Requirements for handling irradiated fuel over the RPV are covered by LCO 3.9.6, "[Reactor Pressure Vessel (RPV)] Water Level - [Irradiated Fuel]."

ACTIONS

A.1

If the water level is < [23] ft above the top of irradiated fuel assemblies seated within the RPV, all operations involving movement of new fuel assemblies and handling of control rods within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of fuel movement and control rod handling shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verification of a minimum water level of [23] ft above the top of irradiated fuel assemblies seated within the RPV ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely. INSERT 2

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.
2. FSAR, Section [15.1.41].
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.11.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.3 Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately |
| | AND | |
| | B.4 Initiate action to restore isolation capability in each required [secondary] containment penetration flow path not isolated. | Immediately |
| C. No RHR shutdown cooling subsystem in operation. | C.1 Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br>AND<br>Once per 12 hours thereafter |
| | AND | |
| | C.2 Monitor reactor coolant temperature. | Once per hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.8.1 | Verify one RHR shutdown cooling subsystem is operating. | 12 hours INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.8.1

This Surveillance demonstrates that the RHR subsystem is in operation and circulating reactor coolant.

The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room. INSERT 2

REFERENCES None.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| | B.3 | Initiate action to restore isolation capability in each required [secondary] containment penetration flow path not isolated. | Immediately |
| C. No RHR shutdown cooling subsystem in operation. | C.1 | Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br><br>AND<br><br>Once per 12 hours thereafter |
| | AND | | |
| | C.2 | Monitor reactor coolant temperature. | Once per hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.9.1 | Verify one RHR shutdown cooling subsystem is operating. | 12 hours INSERT 1 |

BASES

ACTIONS (continued)

isolation capability (i.e., one secondary containment isolation valve and associated instrumentation are OPERABLE or other acceptable administrative controls to assure isolation capability) in each associated penetration not isolated that is assumed to be isolated to mitigate radioactive releases. This may be performed as an administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

C.1 and C.2

If no RHR subsystem is in operation, an alternate method of coolant circulation is required to be established within 1 hour. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR Shutdown Cooling System), the reactor coolant temperature must be periodically monitored to ensure proper functioning of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.9.9.1

This Surveillance demonstrates that one RHR shutdown cooling subsystem is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability.

The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystems in the control room. INSERT 2

REFERENCES

None.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.3.2 ----------NOTE---------- Only applicable in MODE 5. ---------- <br><br> Place the reactor mode switch in the refuel position. | <br><br><br><br>1 hour |

SURVEILLANCE REQUIREMENTS

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

INSERT 1

BASES

ACTIONS (continued)

Table 1.1-1. Alternatively, if in MODE 5, the reactor mode switch may be placed in the refuel position, which will also result in operating in accordance with Table 1.1-1. A Note is added to Required Action A.3.2 to indicate that this Required Action is not applicable in MODES 3 and 4, since only the shutdown position is allowed in these MODES. The allowed Completion Time of 1 hour for Required Action A.2, Required Action A.3.1, and Required Action A.3.2 provides sufficient time to normally insert the control rods and place the reactor mode switch in the required position, based on operating experience, and is acceptable given that all operations that could increase core reactivity have been suspended.

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1 and SR 3.10.2.2

Meeting the requirements of this Special Operations LCO maintains operation consistent with or conservative to operating with the reactor mode switch in the shutdown position (or the refuel position for MODE 5). The functions of the reactor mode switch interlocks that are not in effect, due to the testing in progress, are adequately compensated for by the Special Operations LCO requirements. The administrative controls are to be periodically verified to ensure that the operational requirements continue to be met. The Surveillances performed at the 12 hour and 24 hour Frequencies are intended to provide appropriate assurance that each operating shift is aware of and verifies compliance with these Special Operations LCO requirements. INSERT 2

REFERENCES

1. FSAR, Chapter [7].
2. FSAR, Section [15.1.13].
3. FSAR, Section [15.1.14].

SURVEILLANCE REQUIREMENTS (continued)

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

available, periodic verification in accordance with SR 3.10.3.2 is required to preclude the possibility of criticality. SR 3.10.3.2 has been modified by a Note, which clarifies that this SR is not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements, since SR 3.10.3.2 demonstrates that the alternative LCO 3.10.3.d.2 requirements are satisfied. Also, SR 3.10.3.3 verifies that all control rods other than the control rod being withdrawn are fully inserted. The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawal, the protection afforded by the LCOs involved, and hardwire interlocks that preclude additional control rod withdrawals. INSERT 2

REFERENCES 1. FSAR, Section [15.1.13].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.2.2 Initiate action to satisfy the requirements of this LCO. | Immediately |

SURVEILLANCE REQUIREMENTS

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

BASES

ACTIONS (continued)

Required Actions A.2.1 and A.2.2 are specified, based on the assumption that the control rod is being withdrawn. If the control rod is still insertable, actions must be immediately initiated to fully insert all insertable control rods and within 1 hour place the reactor mode switch in the shutdown position. Actions must continue until all such control rods are fully inserted. The allowed Completion Time of 1 hour for placing the reactor mode switch in the shutdown position provides sufficient time to normally insert the control rods.

B.1, B.2.1, and B.2.2

If one or more of the requirements of this Special Operations LCO are not met with the affected control rod not insertable, withdrawal of the control rod and removal of the associated CRD must be immediately suspended. If the CRD has been removed, such that the control rod is not insertable, the Required Actions require the most expeditious action be taken to either initiate action to restore the CRD and insert its control rod, or initiate action to restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.4.1, SR 3.10.4.2, SR 3.10.4.3, and SR 3.10.4.4

The other LCOs made applicable by this Special Operations LCO are required to have their associated surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed while the scram function for the withdrawn rod is not available, periodic verification is required to ensure that the possibility of criticality remains precluded. Verification that all the other control rods are fully inserted is required to meet the SDM requirements. Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the affected control rod. The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardwire interlocks to preclude an additional control rod withdrawal.

INSERT 2

SR 3.10.4.2 and SR 3.10.4.4 have been modified by Notes, which clarify that these SRs are not required to be met if the alternative requirements demonstrated by SR 3.10.4.1 are satisfied.

REFERENCES

1. FSAR, Section [15.1.13].

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more of the above requirements not met. | A.1 Suspend removal of the CRD mechanism. | Immediately |
| | AND | |
| | A.2.1 Initiate action to fully insert all control rods. | Immediately |
| | OR | |
| | A.2.2 Initiate action to satisfy the requirements of this LCO. | Immediately |

SURVEILLANCE REQUIREMENTS

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

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.5.1, SR 3.10.5.2, SR 3.10.5.3, SR 3.10.5.4, and SR 3.10.5.5

Verification that all the control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted is required to ensure the SDM is within limits. Verification that the local five by five array of control rods, other than the control rod withdrawn for removal of the associated CRD, is inserted and disarmed, while the scram function for the withdrawn rod is not available, is required to ensure that the possibility of criticality remains precluded. Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the withdrawn control rod. The Surveillance for LCO 3.1.1, which is made applicable by this Special Operations LCO, is required in order to establish that this Special Operations LCO is being met. Verification that no other CORE ALTERATIONS are being made is required to ensure the assumptions of the safety analysis are satisfied.

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. The 24 hour Frequency is acceptable, given the administrative controls on control rod removal and hardwire interlock to block an additional control rod withdrawal. INSERT 2

REFERENCES

1. FSAR, Section [15.1.13].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.3.1 Initiate action to fully insert all control rods in core cells containing one or more fuel assemblies. | Immediately |
| | OR | |
| | A.3.2 Initiate action to satisfy the requirements of this LCO. | Immediately |

SURVEILLANCE REQUIREMENTS

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

BASES

ACTIONS (continued)

Completion Times for Required Action A.1, Required Action A.2.1, and Required Action A.2.2 are intended to require that these Required Actions be implemented in a very short time and carried through in an expeditious manner to either initiate action to restore the affected CRDs and insert their control rods, or initiate action to restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.6.1, SR 3.10.6.2, and SR 3.10.6.3

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. The 24 hour Frequency is acceptable, given the administrative controls on fuel assembly and control rod removal, and takes into account other indications of control rod status available in the control room. INSERT 2

REFERENCES

1. FSAR, Section [15.1.13].

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.8.3 | ----------NOTE----------<br>Not required to be met if SR 3.10.8.2 satisfied.<br>----------<br><br>Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff. | During control rod movement |
| SR 3.10.8.4 | Verify no other CORE ALTERATIONS are in progress. | 12 hours |
| SR 3.10.8.5 | Verify each withdrawn control rod does not go to the withdrawn overtravel position. | Each time the control rod is withdrawn to "full out" position<br><br>AND<br><br>Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling |
| SR 3.10.8.6 | Verify CRD charging water header pressure ≥ [940] psig. | 7 days |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.8.4

Periodic verification of the administrative controls established by this LCO will ensure that the reactor is operated within the bounds of the safety analysis. The 12 hour Frequency is intended to provide appropriate assurance that each operating shift is aware of and verifies compliance with these Special Operations LCO requirements.

SR 3.10.8.5

Coupling verification is performed to ensure the control rod is connected to the control rod drive mechanism and will perform its intended function when necessary. The verification is required to be performed any time a control rod is withdrawn to the "full out" notch position, or prior to declaring the control rod OPERABLE after work on the control rod or CRD System that could affect coupling. This Frequency is acceptable, considering the low probability that a control rod will become uncoupled when it is not being moved as well as operating experience related to uncoupling events.

INSERT 2

SR 3.10.8.6

CRD charging water header pressure verification is performed to ensure the motive force is available to scram the control rods in the event of a scram signal. A minimum accumulator pressure is specified, below which the capability of the accumulator to perform its intended function becomes degraded and the accumulator is considered inoperable. The minimum accumulator pressure of 940 psig is well below the expected pressure of 1100 psig. The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.

REFERENCES

1. NEDE-24011-P-A-US, General Electric Standard Application for Reactor Fuel, Supplement for United States (as amended).

2. Letter from T. Pickens (BWROG) to G.C. Lainas, NRC, "Amendment 17 to General Electric Licensing Topical Report NEDE-24011-P-A," August 15, 1986.

3. [Plant specific transient analysis].

4. [Plant specific reload analysis].

## 3.10 SPECIAL OPERATIONS

### 3.10.9 Recirculation Loops - Testing

LCO 3.10.9 The requirements of LCO 3.4.1, "Recirculation Loops Operating," may be suspended for ≤ 24 hours to allow:

a. PHYSICS TESTS, provided THERMAL POWER is ≤ [5]% RTP and

b. Performance of the Startup Test Program.

APPLICABILITY: MODES 1 and 2 with less than two recirculation loops in operation.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Requirements of LCO 3.4.1 not met for > 24 hours. | A.1 | Insert all insertable control rods. | [1] hour |
| B. Requirements of the LCO not met for reasons other than Condition A. | B.1 | Place the reactor mode switch in the shutdown position. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.9.1 | Verify LCO 3.4.1 requirements suspended for ≤ 24 hours. | [1 hour |
| SR 3.10.9.2 | Verify THERMAL POWER is ≤ [5]% RTP during PHYSICS TESTS. | [1 hour |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.9.1 and SR 3.10.9.2

Periodic verification of the administrative controls established by this LCO will ensure that the reactor is operated within the bounds of this LCO. [B]ecause the 1 hour Frequency provides frequent checks of the LCO requirements during the allowed 24 hour testing interval, the probability of operation outside the limits concurrent with a postulated accident is reduced even further. INSERT 2

REFERENCES

1. FSAR, Chapter [14].
2. 10 CFR 50.59.
3. FSAR, Section [6.3.3.4].
4. FSAR, Section [ ].

## 3.10 SPECIAL OPERATIONS

### 3.10.10 Training Startups

LCO 3.10.10 The low pressure coolant injection (LPCI) OPERABILITY requirements specified in LCO 3.5.1, "Emergency Core Cooling Systems (ECCS) - Operating," may be changed to allow one residual heat removal subsystem to be aligned in the shutdown cooling mode for training startups, provided the following requirements are met:

a. All OPERABLE intermediate range monitor (IRM) channels are ≤ [25/40] divisions of full scale on Range 7 and

b. Average reactor coolant temperature is < 200°F.

APPLICABILITY: MODE 2 with one LPCI subsystem suction valve closed.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more of the above requirements not met. | A.1 Place the reactor mode switch in the shutdown position. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.10.1 | Verify all OPERABLE IRM channels are ≤ [25/40] divisions of full scale on Range 7. | [1 hour INSERT 1 |
| SR 3.10.10.2 | Verify average reactor coolant temperature is < 200°F. | [1 hour |

BASES

LCO (continued)

waste disposal system, performance of the training startups may be accomplished with one RHR subsystem aligned in the shutdown cooling mode to maintain average reactor coolant temperature < 200°F. Under these conditions, the THERMAL POWER must be maintained ≤ 1% RTP (equivalent to all OPERABLE IRM channels ≤ 25/40 divisions of full scale on Range 7) and the average reactor coolant temperature must be < 200°F. This Special Operations LCO then allows changing the LPCI OPERABILITY requirements. In addition to the requirements of this LCO, the normally required MODE 2 applicable LCOs must also be met.

APPLICABILITY

Training startups while in MODE 2 may be performed with one RHR subsystem aligned in the shutdown cooling mode to control the reactor coolant temperature. Additional requirements during these tests to restrict the reactor power and reactor coolant temperature provide protection against potential conditions that could require operation of both RHR subsystems in the LPCI mode of operation. Operations in all other MODES are unaffected by this LCO.

ACTIONS

A.1

With one or more of the requirements of this LCO not met, (i.e., any OPERABLE IRM channel > 25/40 divisions of full scale on Range 7, or average reactor coolant temperature ≥ 200°F) the reactor may be in a condition that requires the full complement of ECCS subsystems and the reactor mode switch must be immediately placed in the shutdown position. This results in a condition that does not require all RHR subsystems to be OPERABLE in the LPCI mode of operation. This action may restore compliance with the requirements of this Special Operations LCO or may result in placing the plant in either MODE 3 or MODE 4.

SURVEILLANCE REQUIREMENTS

SR 3.10.10.1 and SR 3.10.10.2

Periodic verification that the THERMAL POWER and reactor coolant temperature limits of this Special Operations LCO are satisfied will ensure that the stored energy in the reactor core and reactor coolant are sufficiently low to preclude the need for all RHR subsystems to be aligned in the LPCI mode of operation. The 1 hour Frequency provides frequent checks of these LCO requirements during the training startup. INSERT 2

REFERENCES

1. FSAR, Section [6.3.2].

5.5 Programs and Manuals

5.5.13 Primary Containment Leakage Rate Testing Program (continued)

1. Containment leakage rate acceptance criterion is ≤ 1.0 $L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 $L_a$ for the Type B and C tests and [< 0.75 $L_a$ for Option A Type A tests] [≤ 0.75 $L_a$ for Option B Type A tests].

2. Air lock testing acceptance criteria are:

   a) Overall air lock leakage rate is ≤ [0.05 $L_a$] when tested at ≥ $P_a$.

   b) For each door, leakage rate is ≤ [0.01 $L_a$] when pressurized to ≥ [10] psig.

e. The provisions of SR 3.0.3 are applicable to the Primary Containment Leakage Rate Testing Program.

f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.14 Battery Monitoring and Maintenance Program

This Program provides for battery restoration and maintenance, based on [the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer] of the following:

a. Actions to restore battery cells with float voltage < [2.13] V, and

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.

Insert 3

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.3.1 | Determine the position of each control rod. | [24 hours |
| SR 3.1.3.2 | ----------NOTE----------<br>Not required to be performed until 7 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RPCS.<br>----------<br><br>Insert each fully withdrawn control rod at least one notch. | [7 days<br>Insert 1 |
| SR 3.1.3.3 | ----------NOTE----------<br>Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RPCS.<br>----------<br><br>Insert each partially withdrawn control rod at least one notch. | [31 days |
| SR 3.1.3.4 | Verify each control rod scram time from fully withdrawn to notch position [13] is ≤ [ ] seconds. | In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4 |
| SR 3.1.3.5 | Verify each control rod does not go to the withdrawn overtravel position. | Each time the control rod is withdrawn to "full out" position<br><br>AND<br><br>Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect coupling |

BASES

ACTIONS (continued)

E.1

In addition to the separation requirements for inoperable control rods, an assumption in the CRDA analysis for ANF fuel is that no more than three inoperable control rods are allowed in any one BPWS group. Therefore, with one or more BPWS groups having four or more inoperable control rods, the control rods must be restored to OPERABLE status. Required Action E.1 is modified by a Note indicating that the Condition is not applicable when THERMAL POWER is > 10% RTP since the BPWS is not required to be followed under these conditions, as described in the Bases for LCO 3.1.6. The allowed Completion Time of 4 hours is acceptable, considering the low probability of a CRDA occurring.

F.1

If any Required Action and associated Completion Time of Condition A, C, D, or E are not met or nine or more inoperable control rods exist, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. This ensures all insertable control rods are inserted and places the reactor in a condition that does not require the active function (i.e., scram) of the control rods. The number of control rods permitted to be inoperable when operating above 10% RTP (i.e., no CRDA considerations) could be more than the value specified, but the occurrence of a large number of inoperable control rods could be indicative of a generic problem, and investigation and resolution of the potential problem should be undertaken. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

The position of each control rod must be determined, to ensure adequate information on control rod position is available to the operator for determining CRD OPERABILITY and controlling rod patterns. Control rod position may be determined by the use of OPERABLE position indicators, by moving control rods to a position with an OPERABLE indicator, or by the use of other appropriate methods. The 24 hour Frequency of this SR is based on operating experience related to expected changes in control rod position and the availability of control rod position indications in the control room.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.3.2 and SR 3.1.3.3

Control rod insertion capability is demonstrated by inserting each partially or fully withdrawn control rod at least one notch and observing that the control rod moves. The control rod may then be returned to its original position. This ensures the control rod is not stuck and is free to insert on a scram signal. These Surveillances are not required when THERMAL POWER is less than or equal to the actual LPSP of the RPC since the notch insertions may not be compatible with the requirements of the Banked Position-Withdrawal Sequence (BPWS) (LCO 3.1.6) and the RPC (LCO 3.3.2.1). [The 7 day Frequency of SR 3.1.3.2 is based on operating experience related to the changes in CRD performance and the ease of performing notch testing for fully withdrawn control rods. Partially withdrawn control rods are tested at a 31 day Frequency, based on the potential power reduction required to allow the control rod movement, and considering the large testing sample of SR 3.1.3.2. Furthermore, the 31 day Frequency takes into account operating experience related to changes in CRD performance. At any time, if a control rod is immovable, a determination of that control rod's trippability (OPERABILITY) must be made and appropriate action taken.

INSERT 2

SR 3.1.3.4

Verifying the scram time for each control rod to notch position 13 is ≤ [ ] seconds provides reasonable assurance that the control rod will insert when required during a DBA or transient, thereby completing its shutdown function. This SR is performed in conjunction with the control rod scram time testing of SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," and the functional testing of SDV vent and drain valves in LCO 3.1.8, "Scram Discharge Volume (SDV) Vent and Drain Valves," overlap this Surveillance to provide complete testing of the assumed safety function. The associated Frequencies are acceptable, considering the more frequent testing performed to demonstrate other aspects of control rod OPERABILITY and operating experience, which shows scram times do not significantly change over an operating cycle.

## 3.1 REACTIVITY CONTROL SYSTEMS

### 3.1.4 Control Rod Scram Times

LCO 3.1.4

a. No more than [14] OPERABLE control rods shall be "slow," in accordance with Table 3.1.4-1 and

b. No more than 2 OPERABLE control rods that are "slow" shall occupy adjacent locations.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Requirements of the LCO not met. | A.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.4.1 | Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ [950] psig. | Prior to exceeding 40% RTP after each reactor shutdown<br>≥ 120 days |
| SR 3.1.4.2 | Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ [950] psig. | [120 days cumulative operation in MODE 1 Insert 1 |

BASES

SURVEILLANCE REQUIREMENTS (continued)

over which scram time testing can be performed. To ensure scram time testing is performed within a reasonable time following a shutdown ≥ 120 days, control rods are required to be tested before exceeding 40% RTP. This Frequency is acceptable, considering the additional surveillances performed for control rod OPERABILITY, the frequent verification of adequate accumulator pressure, and the required testing of control rods affected by fuel movement within the associated core cell and by work on control rods or the CRD System.

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. The sample remains representative if no more than 20% of the control rods in the sample tested are determined to be "slow." If more than 20% of the sample is declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 20% criterion (e.g., 20% of the entire sample size) is satisfied, or until the total number of "slow" control rods (throughout the core, from all Surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data were previously tested in a sample. The 120 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable, based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."

Insert 2

SR 3.1.4.3

When work that could affect the scram insertion time is performed on a control rod or the CRD System, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod OPERABLE. The required scram time testing must demonstrate that the affected control rod is still within acceptable limits. The limits for reactor pressures < 950 psig are established based on a high probability of meeting the acceptance criteria at reactor

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.5.1 | Verify each control rod scram accumulator pressure is ≥ [1520] psig. | [7 days |

Insert 1

BASES

ACTIONS (continued)

degraded during a depressurization event or at low reactor pressures. Therefore, immediately upon discovery of charging water header pressure < [1520] psig, concurrent with Condition C, all control rods associated with inoperable accumulators must be verified to be fully inserted. Withdrawn control rods with inoperable scram accumulators may fail to scram under these low pressure conditions. The associated control rods must also be declared inoperable within 1 hour. The allowed Completion Time of 1 hour is reasonable for Required Action C.2, considering the low probability of a DBA or transient occurring during the time the accumulator is inoperable.

D.1

The reactor mode switch must be immediately placed in the shutdown position if either Required Action and associated Completion Time associated with loss of the CRD charging pump (Required Actions B.1 and C.1) cannot be met. This ensures that all insertable control rods are inserted and that the reactor is in a condition that does not require the active function (i.e., scram) of the control rods. This Required Action is modified by a Note stating that the Required Action is not applicable if all control rods associated with the inoperable scram accumulators are fully inserted, since the function of the control rods has been performed.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

periodically

SR 3.1.5.1 requires that the accumulator pressure be checked every 7 days to ensure adequate accumulator pressure exists to provide sufficient scram force. The primary indicator of accumulator OPERABILITY is the accumulator pressure. A minimum accumulator pressure is specified, below which the capability of the accumulator to perform its intended function becomes degraded and the accumulator is considered inoperable. The minimum accumulator pressure of 1520 psig is well below the expected pressure of 1750 psig to 2000 psig (Ref. 2). Declaring the accumulator inoperable when the minimum pressure is not maintained ensures that significant degradation in scram times does not occur. The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.

INSERT 2

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.2 Place the reactor mode switch in the shutdown position. | 1 hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.6.1 | Verify all OPERABLE control rods comply with [BPWS]. | [24 hours |

Insert 1

BASES

ACTIONS (continued)

Required Action A.1 is modified by a Note, which allows control rods to be bypassed in Rod Action Control System (RACS) to allow the affected control rods to be returned to their correct position. This ensures that the control rods will be moved to the correct position. A control rod not in compliance with the prescribed sequence is not considered inoperable except as required by Required Action A.2. OPERABILITY of control rods is determined by compliance with LCO 3.1.3; LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators." The allowed Completion Time of 8 hours is reasonable, considering the restrictions on the number of allowed out of sequence control rods and the low probability of a CRDA occurring during the time the control rods are out of sequence.

B.1 and B.2

If nine or more OPERABLE control rods are out of sequence, the control rod pattern significantly deviates from the prescribed sequence. Control rod withdrawal should be suspended immediately to prevent the potential for further deviation from the prescribed sequence. Control rod insertion to correct control rods withdrawn beyond their allowed position is allowed since, in general, insertion of control rods has less impact on control rod worth than withdrawals have. Required Action B.1 is modified by a Note that allows the affected control rods to be bypassed in RACS in accordance with SR 3.3.2.1.8 to allow insertion only.

With nine or more OPERABLE control rods not in compliance with BPWS, the reactor mode switch must be placed in the shutdown position within 1 hour. With the reactor mode switch in shutdown, the reactor is shut down, and therefore does not meet the applicability requirements of this LCO. The allowed Completion Time of 1 hour is reasonable to allow insertion of control rods to restore compliance, and is appropriate relative to the low probability of a CRDA occurring with the control rods out of sequence.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

periodically

The control rod pattern is verified to be in compliance with the BPWS at a 24 hour Frequency, ensuring the assumptions of the CRDA analyses are met. The 24 hour Frequency of this Surveillance was developed considering that the primary check of the control rod pattern compliance with the BPWS is performed by the RPC (LCO 3.3.2.1). The RPC provides control rod blocks to enforce the required control rod sequence and is required to be OPERABLE when operating at ≤ 10% RTP.

INSERT 2

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.1 | Verify available volume of sodium pentaborate solution is [≥ [4530] gallons]. | [24 hours |
| SR 3.1.7.2 | [ Verify temperature of sodium pentaborate solution is within the limits of [Figure 3.1.7-1]. | [24 hours] |
| SR 3.1.7.3 | [ Verify temperature of pump suction piping is within the limits of [Figure 3.1.7-1]. | [24 hours] |
| SR 3.1.7.4 | Verify continuity of explosive charge. | [31 days |
| SR 3.1.7.5 | Verify the concentration of boron in solution is [within the limits of Figure 3.1.7-1]. | [31 days<br>AND<br>Once within 24 hours after water or boron is added to solution<br>AND<br>Once within 24 hours after solution temperature is restored within the limits of [Figure 3.1.7-1] |
| SR 3.1.7.6 | Verify each SLC subsystem manual, power operated, [and automatic valve] in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position. | [31 days |

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.7 | Verify each pump develops a flow rate ≥ [41.2] gpm at a discharge pressure ≥ [1300] psig. | [ In accordance with the Inservice Testing Program or 92 days ] |
| SR 3.1.7.8 | Verify flow through one SLC subsystem from pump into reactor pressure vessel. | [18] months on a STAGGERED TEST BASIS Insert 1 |
| SR 3.1.7.9 | [ Verify all heat traced piping between storage tank and pump suction is unblocked. | [18] months<br><br>AND<br><br>Once within 24 hours after solution temperature is restored within the limits of [Figure 3.1.7-1] ] |
| SR 3.1.7.10 | [ Verify sodium pentaborate enrichment is ≥ [60.0] atom percent B-10. | Prior to addition to SLC tank ] |

BASES

ACTIONS (continued)

C.1

If both SLC subsystems are inoperable for reasons other than Condition A, at least one subsystem must be restored to OPERABLE status within 8 hours. The allowed Completion Time of 8 hours is considered acceptable, given the low probability of a DBA or transient occurring concurrent with the failure of the control rods to shut down the reactor.

D.1

If any Required Action and associated Completion Time is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1, SR 3.1.7.2, and SR 3.1.7.3

SR 3.1.7.1 through SR 3.1.7.3 are 24 hour Surveillances, verifying certain characteristics of the SLC System (e.g., the volume and temperature of the borated solution in the storage tank), thereby ensuring the SLC System OPERABILITY without disturbing normal plant operation. These Surveillances ensure the proper borated solution and temperature, including the temperature of the pump suction piping, are maintained. Maintaining a minimum specified borated solution temperature is important in ensuring that the boron remains in solution and does not precipitate out in the storage tank or in the pump suction piping. The 24 hour Frequency of these SRs is based on operating experience that has shown there are relatively slow variations in the measured parameters of volume and temperature.

Insert 2

SR 3.1.7.4 and SR 3.1.7.6

SR 3.1.7.4 verifies the continuity of the explosive charges in the injection valves to ensure proper operation will occur if required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. The 31 day Frequency is based on operating experience that has demonstrated the reliability of the explosive charge continuity.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.7.6 verifies each valve in the system is in its correct position, but does not apply to the squib (i.e., explosive) valves. Verifying the correct alignment for manual, power operated, and automatic valves in the SLC System flow path ensures that the proper flow paths will exist for system operation. A valve is also allowed to be in the nonaccident position, provided it can be aligned to the accident position from the control room, or locally by a dedicated operator at the valve control. This is acceptable since the SLC System is a manually initiated system. This Surveillance does not apply to valves that are locked, sealed, or otherwise secured in position, since they were verified to be in the correct position prior to locking, sealing, or securing. This verification of valve alignment does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct positions. The 31 day Frequency is based on engineering judgment and is consistent with the procedural controls governing valve operation that ensure correct valve positions.

Insert 2

SR 3.1.7.5

This Surveillance requires an examination of the sodium pentaborate solution by using chemical analysis to ensure the proper concentration of boron exists in the storage tank. SR 3.1.7.5 must be performed anytime boron or water is added to the storage tank solution to establish that the boron solution concentration is within the specified limits. This Surveillance must be performed anytime the temperature is restored to within the limits of Figure 3.1.7-1, to ensure no significant boron precipitation occurred. The 31 day Frequency of this Surveillance is appropriate because of the relatively slow variation of boron concentration between surveillances.

SR 3.1.7.7

Demonstrating each SLC System pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1300 psig ensures that pump performance has not degraded during the fuel cycle. This minimum pump flow rate requirement ensures that, when combined with the sodium pentaborate solution concentration requirements, the rate of negative reactivity insertion from the SLC System will adequately compensate for the

BASES

SURVEILLANCE REQUIREMENTS (continued)

positive reactivity effects encountered during power reduction, cooldown of the moderator, and xenon decay. This test confirms one point on the pump design curve, and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this Surveillance is [in accordance with the Inservice Testing Program or 92 days].

Insert 2

SR 3.1.7.8 and SR 3.1.7.9

These Surveillances ensure that there is a functioning flow path from the boron solution storage tank to the RPV, including the firing of an explosive valve. The replacement charge for the explosive valve shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of that batch successfully fired. The pump and explosive valve tested should be alternated such that both complete flow paths are tested every 36 months, at alternating 18 month intervals. The Surveillance may be performed in separate steps to prevent injecting boron into the RPV. An acceptable method for verifying flow from the pump to the RPV is to pump demineralized water from a test tank through one SLC subsystem and into the RPV. The 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. Operating experience has shown these components usually pass the Surveillance test when performed at the 18 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Insert 2

Demonstrating that all heat traced piping between the boron solution storage tank and the suction inlet to the injection pumps is unblocked ensures that there is a functioning flow path for injecting the sodium pentaborate solution. An acceptable method for verifying that the suction piping is unblocked is to pump from the storage tank to the test tank. The 18 month Frequency is acceptable since there is a low probability that the subject piping will be blocked due to precipitation of the boron from solution in the heat traced piping. This is especially true in light of the daily temperature verification of this piping required by SR 3.1.7.3. However, if, in performing SR 3.1.7.3, it is determined that the temperature of this piping has fallen below the specified minimum, SR 3.1.7.9 must be performed once within 24 hours after the piping temperature is restored within the limits of Figure 3.1.7-1.

Insert 2

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.8.1 | ----------NOTE----------<br>Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2.<br>----------<br><br>Verify each SDV vent and drain valve is open. | [31 days Insert 1 |
| SR 3.1.8.2 | Cycle each SDV vent and drain valve to the fully closed and fully open position. | [92 days |
| SR 3.1.8.3 | Verify each SDV vent and drain valve:<br><br>a. Closes in ≤ [30] seconds after receipt of an actual or simulated scram signal and<br><br>b. Opens when the actual or simulated scram signal is reset. | [[18] months |

BASES

ACTIONS (continued)

A.1

When one SDV vent or drain valve is inoperable in one or more lines, the associated line must be isolated to contain the reactor coolant during a scram. The 7 day Completion Time is reasonable, given the level of redundancy in the lines and the low probability of a scram occurring during the time the valve(s) are inoperable and the line is not isolated. The SDV is still isolable since the redundant valve in the affected line is OPERABLE. During these periods, the single failure criterion may not be preserved, and a higher risk exists to allow reactor water out of the primary system during a scram.

B.1

If both valves in a line are inoperable, the line must be isolated to contain the reactor coolant during a scram.

The 8 hour Completion Time to isolate the line is based on the low probability of a scram occurring while the line is not isolated and unlikelihood of significant CRD seal leakage.

C.1

If any Required Action and associated Completion Time is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

During normal operation, the SDV vent and drain valves should be in the open position (except when performing SR 3.1.8.2) to allow for drainage of the SDV piping. Verifying that each valve is in the open position ensures that the SDV vent and drain valves will perform their intended function during normal operation. This SR does not require any testing or valve manipulation; rather, it involves verification that the valves are in the correct position. The 31 day Frequency is based on engineering judgment and is consistent with the procedural controls governing valve operation, which ensure correct valve positions. Improper valve position (closed) would not affect the isolation function.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.2

During a scram, the SDV vent and drain valves should close to contain the reactor water discharged to the SDV piping. Cycling each valve through its complete range of motion (closed and open) ensures that the valve will function properly during a scram. The 92 day Frequency is based on operating experience and takes into account the level of redundancy in the system design.

INSERT 2

SR 3.1.8.3

SR 3.1.8.3 is an integrated test of the SDV vent and drain valves to verify total system performance. After receipt of a simulated or actual scram signal, the closure of the SDV vent and drain valves is verified. The closure time of [30] seconds after a receipt of a scram signal is based on the bounding leakage case evaluated in the accident analysis. Similarly, after receipt of a simulated or actual scram reset signal, the opening of the SDV vent and drain valves is verified. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1 and the scram time testing of control rods in LCO 3.1.3 overlap this Surveillance to provide complete testing of the assumed safety function. The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Insert 2

REFERENCES

1. FSAR, Section [4.6.1.1.2.4.2.6].
2. 10 CFR 100.
3. NUREG-0803, "Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping," August 1981.

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.1 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

LCO 3.2.1 All APLHGRs shall be less than or equal to the limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Any APLHGR not within limits. | A.1 Restore APLHGR(s) to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.1.1 | Verify all APLHGRs are less than or equal to the limits specified in the COLR. | Once within 12 hours after ≥ 25% RTP<br><br>AND<br><br>[24 hours thereafter ← Insert 1 |

BASES

APPLICABILITY

The APLHGR limits are primarily derived from fuel design evaluations and LOCA and transient analyses that are assumed to occur at high power levels. Design calculations (Ref. 4) and operating experience have shown that as power is reduced, the margin to the required APLHGR limits increases. This trend continues down to the power range of 5% to 15% RTP when entry into MODE 2 occurs. When in MODE 2, the intermediate range monitor (IRM) scram function provides prompt scram initiation during any significant transient, thereby effectively removing any APLHGR limit compliance concern in MODE 2. Therefore, at THERMAL POWER levels ≤ 25% RTP, the reactor operates with substantial margin to the APLHGR limits; thus, this LCO is not required.

ACTIONS

A.1

If any APLHGR exceeds the required limits, an assumption regarding an initial condition of the DBA and transient analyses may not be met. Therefore, prompt action is taken to restore the APLHGR(s) to within the required limits such that the plant will be operating within analyzed conditions and within the design limits of the fuel rods. The 2 hour Completion Time is sufficient to restore the APLHGR(s) to within its limits and is acceptable based on the low probability of a transient or DBA occurring simultaneously with the APLHGR out of specification.

B.1

If the APLHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 25% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 25% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

periodically

APLHGRs are required to be initially calculated within 12 hours after THERMAL POWER is ≥ 25% RTP and then every 24 hours thereafter. They are compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution under normal conditions. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels.

Insert 2

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.2 MINIMUM CRITICAL POWER RATIO (MCPR)

LCO 3.2.2 All MCPRs shall be greater than or equal to the MCPR operating limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Any MCPR not within limits. | A.1 Restore MCPR(s) to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.2.1 | Verify all MCPRs are greater than or equal to the limits specified in the COLR. | Once within 12 hours after ≥ 25% RTP<br><br>AND<br><br>24 hours thereafter Insert 1 |

BASES

ACTIONS

A.1

If any MCPR is outside the required limits, an assumption regarding an initial condition of the design basis transient analyses may not be met. Therefore, prompt action should be taken to restore the MCPR(s) to within the required limits such that the plant remains operating within analyzed conditions. The 2 hour Completion Time is normally sufficient to restore the MCPR(s) to within its limits and is acceptable based on the low probability of a transient or DBA occurring simultaneously with the MCPR out of specification.

B.1

If the MCPR cannot be restored to within the required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 25% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 25% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

periodically

The MCPR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 25% RTP and then every 24 hours thereafter. It is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER reaches ≥ 25% RTP is acceptable given the large inherent margin to operating limits at low power levels.

Insert 2

REFERENCES

1. NUREG-0562, June 1979.
2. [Plant specific current cycle safety analysis].
3. FSAR, [Appendix 15B].
4. FSAR, [Appendix 15C].
5. FSAR, [Appendix 15D].

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.3 LINEAR HEAT GENERATION RATE (LHGR) (Optional)

LCO 3.2.3 All LHGRs shall be less than or equal to the limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Any LHGR not within limits. | A.1 Restore LHGR(s) to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.3.1 | Verify all LHGRs are less than or equal to the limits specified in the COLR. | Once within 12 hours after ≥ 25% RTP<br>AND<br>24 hours thereafter Insert 1 |

BASES

LCO

The LHGR is a basic assumption in the fuel design analysis. The fuel has been designed to operate at rated core power with sufficient design margin to the LHGR calculated to cause a 1% fuel cladding plastic strain. The operating limit to accomplish this objective is specified in the COLR.

APPLICABILITY

The LHGR limits are derived from fuel design analysis that is limiting at high power level conditions. At core thermal power levels < 25% RTP, the reactor is operating with a substantial margin to the LHGR limits and, therefore, the Specification is only required when the reactor is operating at ≥ 25% RTP.

ACTIONS

A.1

If any LHGR exceeds its required limit, an assumption regarding an initial condition of the fuel design analysis is not met. Therefore, prompt action should be taken to restore the LHGR(s) to within its required limits such that the plant is operating within analyzed conditions. The 2 hour Completion Time is normally sufficient to restore the LHGR(s) to within its limits and is acceptable based on the low probability of a transient or Design Basis Accident occurring simultaneously with the LHGR out of specification.

B.1

If the LHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 25% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 25% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

periodically

The LHGR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 25% RTP and then every 24 hours thereafter. It is compared with the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution under normal conditions. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at lower power levels.

Insert 2

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.2.4.1 | ----------NOTE----------<br>Not required to be met if SR 3.2.4.2 is satisfied for LCO 3.2.4 Item b or c requirements.<br>----------<br><br>Verify MFLPD is within limits. | Once within 12 hours after ≥ 25% RTP<br><br>AND<br><br>[24 hours thereafter |
| SR 3.2.4.2 | ----------NOTE----------<br>Not required to be met if SR 3.2.4.1 is satisfied for LCO 3.2.4 Item a requirements.<br>----------<br><br>Verify APRM setpoints or gains are adjusted for the calculated MFLPD. | Insert 1<br><br>[12 hours |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1 and SR 3.2.4.2

The MFLPD is required to be calculated and compared to FRTP or APRM gain or setpoints to ensure that the reactor is operating within the assumptions of the safety analysis. These SRs are required only to determine the MFLPD and, assuming MFLPD is greater than FRTP, the appropriate gain or setpoint, and is not intended to be a CHANNEL FUNCTIONAL TEST for the APRM gain or flow biased neutron flux scram circuitry. The 24 hour Frequency of SR 3.2.4.1 is chosen to coincide with the determination of other thermal limits, specifically those for the APLHGR (LCO 3.2.1). The 24 hour Frequency of SR 3.2.4.1 is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER ≥ 25% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels.

The 12 hour Frequency of SR 3.2.4.2 requires a more frequent verification than if MFLPD is less than or equal to fraction of rated power (FRP). When MFLPD is greater than FRP, more rapid changes in power distribution are typically expected. Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10, GDC 13, GDC 20, and GDC 29.
2. FSAR, Section [ ].
3. FSAR, Section [ ].

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ---------- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power ≤ 2% RTP [plus any gain adjustment required by LCO 3.2.4, "Average Power Range Monitor (APRM) Gain and Setpoints"] while operating at ≥ 25% RTP. | [7 days |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | [7 days |
| SR 3.3.1.1.4 | ----------NOTE---------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST. | [7 days |
| SR 3.3.1.1.5 | Perform CHANNEL FUNCTIONAL TEST. | [7 days |
| SR 3.3.1.1.6 | Calibrate the local power range monitors. | [1000 MWD/T average core exposure |

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.7 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.1.1.8 | [ Calibrate the trip units. | [[92] days ] |
| SR 3.3.1.1.9 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. For function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL CALIBRATION. | [184 days |
| SR 3.3.1.1.10 | Perform CHANNEL FUNCTIONAL TEST. | [[18] months |
| SR 3.3.1.1.11 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br>2. For function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.1.1.12 | Verify the APRM Flow Biased Simulated Thermal Power - High time constant is ≤ [7] seconds. | [[18] months |
| SR 3.3.1.1.13 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |
| SR 3.3.1.1.14 | Verify Turbine Stop Valve Closure, Trip Oil Pressure - Low and Turbine Control Valve Fast Closure Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ [40]% RTP. | [18] months |

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.15 | ----------NOTES[]---------- <br> 1. Neutron detectors are excluded. <br> [2. For Function 6, "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency.] <br> ---------- <br> Verify the RPS RESPONSE TIME is within limits. | [[18] months on a STAGGERED TEST BASIS |

Insert 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

As noted at the beginning of the SRs, the SRs for each RPS instrumentation Function are located in the SRs column of Table 3.3.1.1-1.

The Surveillances are modified by a Note to indicate that, when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the RPS reliability analysis (Ref. 10) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The agreement criteria includes an expectation of one decade of overlap when transitioning between neutron flux instrumentation. The overlap between SRMs and IRMs must be demonstrated prior to withdrawing SRMs from the fully inserted position since indication is being transitioned from the SRMs to the IRMs. This will ensure that reactor power will not be increased into a neutron flux region without adequate indication. The overlap between IRMs and APRMs is of concern when reducing power into the IRM range (entry into MODE 2 from MODE 1). On power

BASES

SURVEILLANCE REQUIREMENTS (continued)

increases, the system design will prevent further increases (by initiating a rod block) if adequate overlap is not maintained. Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between MODE 1 and MODE 2 can be made without either APRM downscale rod block or IRM upscale rod block. Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above mid-scale on Range 1 before SRMs have reached the upscale rod block.

If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channels(s) declared inoperable. Only those appropriate channels that are required in the current MODE or condition should be declared inoperable.

Insert 2

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance. LCO 3.2.4, "Average Power Range Monitor (APRM) Gain and Setpoints," allows the APRMs to be reading greater than actual THERMAL POWER to compensate for localized power peaking. When this adjustment is made, the requirement for the APRMs to indicate within 2% RTP of calculated power is modified to require the APRMs to indicate within 2% RTP of calculated MFLPD. The Frequency of once per 7 days is based on minor changes in LPRM sensitivity, which could affect the APRM reading between performances of SR 3.3.1.1.6.

INSERT 2

A restriction to satisfying this SR when < 25% RTP is provided that requires the SR to be met only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 25% RTP. At low power levels, a high degree of accuracy is unnecessary because of the large inherent margin to thermal limits (MCPR and APLHGR). At ≥ 25% RTP, the

BASES

SURVEILLANCE REQUIREMENTS (continued)

Surveillance is required to have been satisfactorily performed within the last 7 days in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 25% if the 7 day Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 25% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

SR 3.3.1.1.3

The Average Power Range Monitor Flow Biased Simulated Thermal Power - High Function uses the recirculation loop drive flows to vary the trip setpoint. This SR ensures that the total loop drive flow signals from the flow unit used to vary the setpoint are appropriately compared to a calibrated flow signal and therefore the APRM Function accurately reflects the required setpoint as a function of flow. Each flow signal from the respective flow unit must be ≤ 105% of the calibrated flow signal. If the flow unit signal is not within the limit, the APRMs that receive an input from the inoperable flow unit must be declared inoperable.

The Frequency of 7 days is based on engineering judgment, operating experience, and the reliability of this instrumentation.

Insert 2

SR 3.3.1.1.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

As noted, SR 3.3.1.1.4 is not required to be performed when entering MODE 2 from MODE 1 since testing of the MODE 2 required IRM and APRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This allows entry into MODE 2 if the 7 day Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after entering MODE 2 from MODE 1. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

A Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval and is based on reliability analysis (Ref. 10).

INSERT 2

SR 3.3.1.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. In accordance with Reference 10, the scram contacts must be tested as part of the Manual Scram Function. A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on the reliability analysis of Reference 10. (The Manual Scram Function's CHANNEL FUNCTIONAL TEST Frequency was credited in the analysis to extend many automatic scram Functions' Frequencies.)

Insert 2

SR 3.3.1.1.6

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 1000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes.

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.7 and SR 3.3.1.1.10

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The 92 day Frequency of SR 3.3.1.1.7 is based on the reliability analysis of Reference 10.

INSERT 2

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.1.1.8

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.1.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days for SR 3.3.1.1.8 is based on the reliability analysis of Reference 10.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.9 and SR 3.3.1.1.11

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

Note 1 states that neutron detectors are excluded from CHANNEL CALIBRATION because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 7 day calorimetric calibration (SR 3.3.1.1.2) and the 1000 MWD/T LPRM calibration against the TIPs (SR 3.3.1.1.6). A second Note is provided that requires the APRM and IRM SRs to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM and IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR. The Frequency of SR 3.3.1.1.9 is based upon the assumption of a 184 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.1.1.11 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

Insert 2

SR 3.3.1.1.12

The Average Power Range Monitor Flow Biased Simulated Thermal Power - High Function uses an electronic filter circuit to generate a signal proportional to the core THERMAL POWER from the APRM neutron flux signal. This filter circuit is representative of the fuel heat transfer dynamics that produce the relationship between the neutron flux and the core THERMAL POWER. The filter time constant must be verified to ensure that the channel is accurately reflecting the desired parameter.

The Frequency of 18 months is based on engineering judgment and reliability of the components.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.13

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods, in LCO 3.1.3, "Control Rod OPERABILITY," and SDV vent and drain valves, in LCO 3.1.8, "Scram Discharge Volume (SDV) Vent and Drain Valves," overlaps this Surveillance to provide complete testing of the assumed safety function.

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

Insert 2

SR 3.3.1.1.14

This SR ensures that scrams initiated from the Turbine Stop Valve Closure, Trip Oil Pressure - Low and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 40% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodology are incorporated into the actual setpoint. Because main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from turbine first stage pressure), the main turbine bypass valves must remain closed at THERMAL POWER ≥ 40% RTP to ensure that the calibration remains valid.

If any bypass channel setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 40% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve, Trip Oil Pressure - Low and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel is considered OPERABLE.

The Frequency of 18 months is based on engineering judgment and reliability of the components.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.15

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The RPS RESPONSE TIME acceptance criteria are included in Reference 11.

RPS RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[----------REVIEWER'S NOTE----------
The following Bases are applicable for plants adopting NEDO-32291-A and/or Supplement 1.
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However, the sensors for Functions 3, 4, and 5 are allowed to be excluded from specific RPS RESPONSE TIME measurement if the conditions of Reference 12 are satisfied. If these conditions are satisfied, sensor response time may be allocated based on either assumed design sensor response time or the manufacturer's stated design response time. When the requirements of Reference 12 are not satisfied, sensor response time must be measured. Furthermore, measurement of the instrument loops response times for Functions 3, 4, and 5 is not required if the conditions of Reference 13 are satisfied.]

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time.

[RPS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Note 2 requires STAGGERED TEST BASIS Frequency to be determined based on 4 channels per trip system, in lieu of the 8 channels specified in Table 3.3.1.1-1 for the MSIV Closure Function. This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious time degradation, but not channel failure, are infrequent.

Insert 2

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. One or more required SRMs inoperable in MODE 5. | E.1 Suspend CORE ALTERATIONS except for control rod insertion. | Immediately |
| | AND | |
| | E.2 Initiate action to insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.1 | Perform CHANNEL CHECK. | [12 hours |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.2 | ----------NOTES----------<br>1. Only required to be met during CORE ALTERATIONS.<br>2. One SRM may be used to satisfy more than one of the following.<br>----------<br>Verify an OPERABLE SRM detector is located in:<br>a. The fueled region,<br>b. The core quadrant where CORE ALTERATIONS are being performed when the associated SRM is included in the fueled region, and<br>c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region. | [12 hours |
| SR 3.3.1.2.3 | Perform CHANNEL CHECK. | [24 hours |
| SR 3.3.1.2.4 | ----------NOTE----------<br>Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.<br>----------<br>Verify count rate is:<br>a. ≥ [3.0] cps with a signal to noise ratio≥ [2:1] or<br>b. ≥ [0.7] cps with a signal to noise ratio≥ [20:1]. | [12 hours during CORE ALTERATIONS<br>AND<br>24 hours |
| SR 3.3.1.2.5 | Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio]. | [7 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.2.6 | ----------NOTE----------<br>Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio]. | [31 days |
| SR 3.3.1.2.7 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br><br>2. Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>----------<br><br>Perform CHANNEL CALIBRATION. | Insert 1<br><br>[18] months |

BASES

SURVEILLANCE REQUIREMENTS

The SRs for each SRM Applicable MODE or other specified condition are found in the SRs column of Table 3.3.1.2-1.

SR 3.3.1.2.1 and SR 3.3.1.2.3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to the same parameter indicated on other similar channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency of once every 12 hours for SR 3.3.1.2.1 is based on operating experience that demonstrates channel failure is rare. While in MODES 3 and 4, reactivity changes are not expected; therefore, the 12 hour Frequency is relaxed to 24 hours for SR 3.3.1.2.3. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

Insert 2

SR 3.3.1.2.2

To provide adequate coverage of potential reactivity changes in the core, one SRM is required to be OPERABLE in the quadrant where CORE ALTERATIONS are being performed, and the other OPERABLE SRM must be in an adjacent quadrant containing fuel. Note 1 states that this SR is required to be met only during CORE ALTERATIONS. It is not required to be met at other times in MODE 5 since core reactivity changes are not occurring. This Surveillance consists of a review of plant logs to ensure that SRMs required to be OPERABLE for given CORE ALTERATIONS are, in fact, OPERABLE. In the event that only one SRM is required to be OPERABLE, per Table 3.3.1.2-1, footnote (b), only the a. portion of this SR is required. Note 2 clarifies that more than one of the three requirements can be met by the same OPERABLE SRM. The

BASES

SURVEILLANCE REQUIREMENTS (continued)

12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities, which include steps to ensure that the SRMs required by the LCO are in the proper quadrant.

INSERT 2

SR 3.3.1.2.4

This Surveillance consists of a verification of the SRM instrument readout to ensure that the SRM reading is greater than a specified minimum count rate. This ensures that the detectors are indicating count rates indicative of neutron flux levels within the core. With few fuel assemblies loaded, the SRMs will not have a high enough count rate to satisfy the SR. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the minimum count rate.

To accomplish this, the SR is modified by a Note that states that the count rate is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated quadrant, even with a control rod withdrawn the configuration will not be critical.

The Frequency is based upon channel redundancy and other information available in the control room, and ensures that the required channels are frequently monitored while core reactivity changes are occurring. When no reactivity changes are in progress, the Frequency is relaxed from 12 hours to 24 hours.

INSERT 2

SR 3.3.1.2.5 and SR 3.3.1.2.6

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated channel will function properly. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. SR 3.3.1.2.5 is required in MODE 5 and the 7 day

BASES

SURVEILLANCE REQUIREMENTS (continued)

Frequency ensures that the channels are OPERABLE while core reactivity changes could be in progress. This 7 day Frequency is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

SR 3.3.1.2.6 is required in MODE 2 with IRMs on Range 2 or below and in MODES 3 and 4. Since core reactivity changes do not normally take place, the Frequency has been extended from 7 days to 31 days. The 31 day Frequency is based on operating experience and on other Surveillances (such as (CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

Verification of the signal to noise ratio also ensures that the detectors are inserted to a normal operating level. In a fully withdrawn condition, the detectors are sufficiently removed from the fueled region of the core to essentially eliminate neutrons from reaching the detector. Any count rate obtained while fully withdrawn is assumed to be "noise" only. INSERT 2

The Note to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the 31 day Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

SR 3.3.1.2.7

Performance of a CHANNEL CALIBRATION verifies the performance of the SRM detectors and associated circuitry. The Frequency considers the plant conditions required to perform the test, the ease of performing the test, and the likelihood of a change in the system or component status. Insert 2 The neutron detectors are excluded from the CHANNEL CALIBRATION because they cannot readily be adjusted. The detectors are fission chambers that are designed to have a relatively constant sensitivity over the range, and with an accuracy specified for a fixed useful life.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the 18 month Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

REFERENCES None.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.1 | ----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is > [70]% RTP. ---------- Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.1.2 | ----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is > 35% RTP and ≤ 70% RTP. ---------- Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.1.3 | ----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ [10]% RTP in MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.1.4 | ----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is ≤ [10]% RTP in MODE 1. ---------- Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.2.1.5 | Calibrate the trip unit. | 92 days |

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.6 | Verify the RWL high power Function is not bypassed when THERMAL POWER is > [70]% RTP. | [92 days |
| SR 3.3.2.1.7 | Perform CHANNEL CALIBRATION. The Allowable Value shall be:<br>a. Low power setpoint, > [10]% RTP and ≤ [35]% RTP and<br>b. High power setpoint, ≤ [70]% RTP. | [184 days |
| SR 3.3.2.1.8 | ----------NOTE----------<br>Not required to be performed until 1 hour after reactor mode switch is in the shutdown position.<br>----------<br>Perform CHANNEL FUNCTIONAL TEST. | [18] months |
| SR 3.3.2.1.9 | Verify the bypassing and movement of control rods required to be bypassed in Rod Action Control System (RACS) by a second licensed operator or other qualified member of the technical staff. | Prior to and during the movement of control rods bypassed in RACS |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SR, the SRs for each Control Rod Block instrumentation Function are found in the SRs column of Table 3.3.2.1-1.

The Surveillances are also modified by a Note to indicate that when an RWL channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains control rod block capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 8) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a control rod block will be initiated when necessary.

SR 3.3.2.1.1, SR 3.3.2.1.2, SR 3.3.2.1.3, and SR 3.3.2.1.4

The CHANNEL FUNCTIONAL TESTS for the RPC and RWL are performed by attempting to withdraw a control rod not in compliance with the prescribed sequence and verifying that a control rod block occurs. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. As noted, the SRs are not required to be performed until 1 hour after specified conditions are met (e.g., after any control rod is withdrawn in MODE 2). This allows entry into the appropriate conditions needed to perform the required SRs. The Frequencies are based on reliability analysis (Ref. 7).

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.5

The LPSP is the point at which the RPCS makes the transition between the function of the RPC and the RWL. This transition point is automatically varied as a function of power. This power level is inferred from the first stage turbine pressure (one channel to each trip system). These power setpoints must be verified periodically to be within the Allowable Values. If any LPSP is nonconservative, then the affected Functions are considered inoperable. Since this channel has both upper and lower required limits, it is not allowed to be placed in a condition to enable either the RPC or RWL Function. Because main turbine bypass steam flow can affect the LPSP nonconservatively for the RWL, the RWL is considered inoperable with any main turbine bypass valves open. The Frequency of 92 days is based on the setpoint methodology utilized for these channels.

INSERT 2

SR 3.3.2.1.6

This SR ensures the high power function of the RWL is not bypassed when power is above the HPSP. The power level is inferred from turbine first stage pressure signals. Periodic testing of the HPSP channels is required to verify the setpoint to be less than or equal to the limit. Adequate margins in accordance with setpoint methodologies are included. If the HPSP is nonconservative, then the RWL is considered inoperable. Alternatively, the HPSP can be placed in the conservative condition (nonbypass). If placed in the nonbypassed condition, the SR is met and the RWL would not be considered inoperable. Because main turbine bypass steam flow can affect the HPSP nonconservatively for the RWL, the RWL is considered inoperable with any main turbine bypass valve open. The Frequency of 92 days is based on the setpoint methodology utilized for these channels.

INSERT 2

SR 3.3.2.1.7

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.2.1.8

The CHANNEL FUNCTIONAL TEST for the Reactor Mode Switch - Shutdown Position Function is performed by attempting to withdraw any control rod with the reactor mode switch in the shutdown position and verifying a control rod block occurs. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

As noted in the SR, the Surveillance is not required to be performed until 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable limits. This allows entry into MODES 3 and 4 if the 18 month Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

Insert 2

SR 3.3.2.1.9

LCO 3.1.3 and LCO 3.1.6 may require individual control rods to be bypassed in RACS to allow insertion of an inoperable control rod or correction of a control rod pattern not in compliance with BPWS. With the control rods bypassed in the RACS, the RPC will not control the movement of these bypassed control rods. To ensure the proper bypassing and movement of those affected control rods, a second licensed operator or other qualified member of the technical staff must verify the bypassing and movement of these control rods. Compliance with this SR allows the RPC to be OPERABLE with these control rods bypassed.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. As required by Required Action D.1 and referenced in Table 3.3.3.1-1. | E.1 Be in MODE 3. | 12 hours |
| F. [ As required by Required Action D.1 and referenced in Table 3.3.3.1-1. | F.1 Initiate action in accordance with Specification 5.6.7. | Immediately ] |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
These SRs apply to each Function in Table 3.3.3.1-1.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.1.1 | Perform CHANNEL CHECK. | [31 days |
| SR 3.3.3.1.2 | Perform CHANNEL CALIBRATION. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

F.1

Since alternate means of monitoring primary containment area radiation have been developed and tested, the Required Action is not to shut down the plant but rather to follow the directions of Specification 5.6.7. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. 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

The following SRs apply to each PAM instrumentation Function in Table 3.3.3.1-1.

SR 3.3.3.1.1

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 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 the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared to similar plant instruments located throughout the plant.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency of 31 days is based upon plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given function in any 31 day interval is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of those displays associated with the required channels of this LCO.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.1.2

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 the measured parameter with the necessary range and accuracy. The Frequency is based on operating experience and consistency with the typical industry refueling cycles.

INSERT 2

REFERENCES

1. Regulatory Guide 1.97, "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," [Date].

[ 2. Plant specific documents (e.g., FSAR, NRC Regulatory Guide 1.97, SER letter). ]

## 3.3 INSTRUMENTATION

### 3.3.3.2 Remote Shutdown System

LCO 3.3.3.2 The Remote Shutdown System Functions shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required Functions inoperable. | A.1 Restore required Function to OPERABLE status. | 30 days |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.2.1 | [ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized. | [31 days ] |
| SR 3.3.3.2.2 | Verify each required control circuit and transfer switch is capable of performing the intended functions. | [[18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.2.3 | Perform CHANNEL CALIBRATION for each required instrumentation channel. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.2.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the 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 that are normally energized.

The Frequency is based upon plant operating experience that demonstrates channel failure is rare.

INSERT 2

SR 3.3.3.2.2

SR 3.3.3.2.2 verifies each required Remote Shutdown System transfer switch and control circuit performs the intended function. This verification is performed from the remote 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 plant can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. However, this Surveillance is not required to be performed only during a plant outage. Operating experience demonstrates that Remote Shutdown System control channels usually pass the Surveillance when performed at the 18 month Frequency.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.2.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies the channel responds to measured parameter values with the necessary range and accuracy.

The 18 month Frequency is based upon operating experience and is consistent with the typical industry refueling cycle. INSERT 2

REFERENCES 1. 10 CFR 50, Appendix A, GDC 19.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. One or more Functions with EOC-RPT trip capability not maintained. | B.1 Restore EOC-RPT trip capability. | 2 hours |
| | OR | |
| AND | [ B.2 Apply the MCPR limit for inoperable EOC-RPT as specified in the COLR. | 2 hours ] |
| [MCPR limit for inoperable EOC-RPT not made applicable.] | | |
| C. Required Action and associated Completion Time not met. | C.1 Remove the associated recirculation pump fast speed breaker from service. | 4 hours |
| | OR | |
| | C.2 Reduce THERMAL POWER to < [40]% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.1.1 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.4.1.2 | [ Calibrate the trip units. | [[92] days ] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.1.3 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br>a. TSV Closure, Trip Oil Pressure - Low: ≥ [37] psig and<br>b. TCV Fast Closure, Trip Oil Pressure - Low: ≥ [42] psig. | [18] months |
| SR 3.3.4.1.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation. | [18] months |
| SR 3.3.4.1.5 | Verify TSV Closure, Trip Oil Pressure - Low and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ [40]% RTP. | [18] months |
| SR 3.3.4.1.6 | ----------NOTE----------<br>Breaker [interruption] time may be assumed from the most recent performance of SR 3.3.4.1.7.<br>----------<br>Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits. | [18] months on a STAGGERED TEST BASIS |
| SR 3.3.4.1.7 | Determine RPT breaker [interruption] time. | [60 months |

INSERT 1

BASES

ACTIONS (continued)

C.1 and C.2

With any Required Action and associated Completion Time not met, THERMAL POWER must be reduced to < 40% RTP within 4 hours. Alternately, the associated recirculation pump may be removed from service since this performs the intended function of the instrumentation. The allowed Completion Time of 4 hours is reasonable, based on operating experience, to reduce THERMAL POWER to < 40% RTP from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains EOC-RPT trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 5) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the recirculation pumps will trip when necessary.

SR 3.3.4.1.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on reliability analysis (Ref. 5). INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.1.2

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the setting is discovered to be less conservative than the Allowable Value specified in SR 3.3.4.1.3. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on assumptions of the reliability analysis (Ref. 5) and on the methodology included in the determination of the trip setpoint.

INSERT 2

SR 3.3.4.1.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval, in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.4.1.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers is included as a part of this test, overlapping the LOGIC SYSTEM FUNCTIONAL TEST, to provide complete testing of the associated safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel would also be inoperable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Operating experience has shown these components usually pass the Surveillance test when performed at the 18 month Frequency.

SR 3.3.4.1.5

This SR ensures that an EOC-RPT initiated from the TSV Closure, Trip Oil Pressure - Low and TCV Fast Closure, Trip Oil Pressure - Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 40% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. Because main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from first stage pressure), the main turbine bypass valves must remain closed at THERMAL POWER ≥ 40% RTP to ensure that the calibration remains valid. If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 40% RTP either due to open main turbine bypass valves or other reasons), the affected TSV Closure, Trip Oil Pressure - Low and TCV Fast Closure, Trip Oil Pressure - Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel considered OPERABLE.

INSERT 2

The Frequency of 18 months has shown that channel bypass failures between successive tests are rare.

SR 3.3.4.1.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The EOC-RPT SYSTEM RESPONSE TIME acceptance criteria are included in Reference 6.

A Note to the Surveillance states that breaker interruption time may be assumed from the most recent performance of SR 3.3.4.1.7. This is allowed since the time to open the contacts after energization of the trip coil and the arc suppression time are short and do not appreciably change, due to the design of the breaker opening device and the fact that the breaker is not routinely cycled.

BASES

SURVEILLANCE REQUIREMENTS (continued)

EOC-RPT SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Response times cannot be determined at power because operation of final actuated devices is required. Therefore, the 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components that cause serious response time degradation, but not channel failure, are infrequent occurrences.

INSERT 2

SR 3.3.4.1.7

This SR ensures that the RPT breaker interruption time (arc suppression time plus time to open the contacts) is provided to the EOC-RPT SYSTEM RESPONSE TIME test. The 60 month Frequency of the testing is based on the difficulty of performing the test and the reliability of the circuit breakers.

REFERENCES

1. FSAR, Figure [ ] (EOC-RPT instrumentation logic).
2. FSAR, Section [5.2.2].
3. FSAR, Sections [15.1.1], [15.1.2], and [15.1.3].
4. FSAR, Sections [5.5.16.1] and [7.6.10].
5. GENE-770-06-1, "Bases for Changes To Surveillance Test Intervals And Allowed Out-Of-Service Times For Selected Instrumentation Technical Specifications," February 1991.
6. FSAR, Section [5.5.16.2].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| C. Both Functions with ATWS-RPT trip capability not maintained. | C.1 | Restore ATWS-RPT trip capability for one Function. | 1 hour |
| D. Required Action and associated Completion Time not met. | D.1 | ----------NOTE---------- Only applicable if inoperable channel is the result of an inoperable RPT breaker. ---------- Remove the affected recirculation pump from service. | 6 hours |
| | OR | | |
| | D.2 | Be in MODE 2. | 6 hours |

SURVEILLANCE REQUIREMENTS

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

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.2.1 | [ Perform CHANNEL CHECK. | [12 hours ] |
| SR 3.3.4.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.4.2.3 | [ Calibrate the trip units. | [92] days ] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.2.4 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. Reactor Vessel Water Level - Low Low, Level 2: ≥ [-43.8] inches and<br><br>b. Reactor Steam Dome Pressure - High: ≤ [1102] psig. | [18] months<br><br>Insert 1 |
| SR 3.3.4.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation. | [18] months |

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the required channels of this LCO.

INSERT 2

SR 3.3.4.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.3

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in SR 3.3.4.2.4. If the trip setting is discovered to be less conservative than the setting accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 2.

SR 3.3.4.2.4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

INSERT 2

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.4.2.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers, included as part of this Surveillance, overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) would be inoperable.

The 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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| H. Required Action and associated Completion Time of Condition B, C, D, E, F, or G not met. | H.1 Declare associated supported feature(s) inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

NOTES

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

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

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.5.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.5.1.3 | [ Calibrate the trip unit. | [[92] days ] |
| SR 3.3.5.1.4 | [ Perform CHANNEL CALIBRATION. | [92 days ] |
| SR 3.3.5.1.5 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.5.1.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |
| SR 3.3.5.1.7 | Verify the ECCS RESPONSE TIME is within limits. | [[18] months on a STAGGERED TEST BASIS |

INSERT 1

BASES

ACTIONS (continued)

H.1

With any Required Action and associated Completion Time not met, the associated feature(s) may be incapable of performing the intended function and the supported feature(s) associated with the inoperable untripped channels must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each ECCS instrumentation Function are found in the SRs column of Table 3.3.5.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours as follows: (a) for Functions 3.c, 3.f, 3.g, and 3.h; and (b) for Functions other than 3.c, 3.f, 3.g, and 3.h provided the associated Function or redundant Function maintains ECCS initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 4) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary.

SR 3.3.5.1.1

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.5.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

INSERT 2

The Frequency of 92 days is based on the reliability analyses of Reference 4.

SR 3.3.5.1.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be not within its required Allowable Value specified in Table 3.3.5.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analyses. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than the setting accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 4.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.4 and SR 3.3.5.1.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.5.1.4 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.5.1.5 is based upon the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.5.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.1, LCO 3.5.2, LCO 3.8.1, and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety function.

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 unplanned transients if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency.

SR 3.3.5.1.7

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Reference 5.

ECCS RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[----------REVIEWER'S NOTE----------
The following Bases are applicable for plants adopting NEDO-32291-A.
---

However, the measurement of instrument loop response times may be excluded if the conditions of Reference 6 are satisfied.]

[ECCS RESPONSE TIME tests are conducted on an [18] month STAGGERED TEST BASIS. The [18] month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent. INSERT 2

REFERENCES

1. FSAR, Section [5.2].

2. FSAR, Section [6.3].

3. FSAR, Chapter [15].

4. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988.

5. FSAR, Section [6.3], Table [6.3-2].

[6. NEDO-32291-A, "System Analyses for the Elimination of Selected Response Time Testing Requirements," October 1995.]

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 5; and (b) for up to 6 hours for Functions 1, 3, and 4 provided the associated Function maintains RCIC initiation capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.5.2.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.5.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.5.2.3 | [ Calibrate the trip units. | [[92] days] |
| SR 3.3.5.2.4 | Perform CHANNEL CALIBRATION. | [18 months |
| SR 3.3.5.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted in the beginning of the SRs, the SRs for each RCIC System instrumentation Function are found in the SRs column of Table 3.3.5.2-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 5; and (b) for up to 6 hours for Functions 1, 3, and 4 provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RCIC will initiate when necessary.

SR 3.3.5.2.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with the channels required by the LCO.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 1.

SR 3.3.5.2.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.5.2-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be re-adjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 1.

INSERT 2

SR 3.3.5.2.4

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter with the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.3 overlaps this Surveillance to provide complete testing of the safety function.

The 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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. INSERT 2

REFERENCES

1. NEDE-770-06-2, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.6.1.3 | [ Calibrate the trip unit. | [[92] days] |
| SR 3.3.6.1.4 | Perform CHANNEL CALIBRATION. | [92 days |
| SR 3.3.6.1.5 | Perform CHANNEL CALIBRATION. | [[18] months INSERT 1 |
| SR 3.3.6.1.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |
| ----------REVIEWER'S NOTE---------- This SR is applied only to Functions of Table 3.3.6.1-1 with required response times not corresponding to DG start time. ---------- | | |
| SR 3.3.6.1.7 | ----------NOTE---------- [ Radiation detectors may be excluded. ] ---------- Verify the ISOLATION SYSTEM RESPONSE TIME is within limits. | [[18] months on a STAGGERED TEST BASIS |

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the PCIVs will isolate the penetration flow path(s) when necessary.

SR 3.3.6.1.1

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

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare.

INSERT 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency is based on reliability analysis described in References 5 and 6.

SR 3.3.6.1.3

The calibration of trip units consists of a test to provide a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

INSERT 2

The Frequency of 92 days is based on the reliability analysis of References 5 and 6.

SR 3.3.6.1.4 and SR 3.3.6.1.5

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of SR 3.3.6.1.4 is based on the assumption of a 92 day calibration interval in the determination of equipment drift in the setpoint analysis. The Frequency of SR 3.3.6.1.5 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. INSERT 2

SR 3.3.6.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on PCIVs in LCO 3.6.1.3 overlaps this Surveillance to provide complete testing of the assumed safety function. The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. INSERT 2

SR 3.3.6.1.7

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the PCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7.

ISOLATION SYSTEM RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[----------REVIEWER'S NOTE----------
The following Bases are applicable for plants adopting NEDO-32291-A and/or Supplement 1.
----------

BASES

SURVEILLANCE REQUIREMENTS (continued)

However, the sensors for Functions 1.a, 1.b, and 1.c are allowed to be excluded from specific ISOLATION SYSTEM RESPONSE TIME measurement if the conditions of Reference 8 are satisfied. If these conditions are satisfied, sensor response time may be allocated based on either assumed design sensor response time or the manufacturer's stated design response time. When the requirements of Reference 8 are not satisfied, sensor response time must be measured. Furthermore, measurement of the instrument loops response time for Functions 1.a, 1.b, and 1.c is not required if the conditions of Reference 9 are satisfied. For all other Functions, the measurement of instrument loop response times may be excluded if the conditions of Reference 8 are satisfied.]

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detection channels shall be measured from detector output or the input of the first electronic component in the channel.

[ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month test Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent. INSERT 2

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.

4. FSAR, Section [9.3.5].

5. NEDC-31677-P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," June 1989.

6. NEDC-30851-P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2.1 Place the associated standby gas treatment (SGT) subsystem(s) in operation. | 1 hour |
| | OR | |
| | C.2.2 Declare associated SGT subsystem inoperable. | 1 hour |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.2.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.2.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.6.2.3 | [ Calibrate the trip unit. | [92] days] |
| SR 3.3.6.2.4 | Perform CHANNEL CALIBRATION. | [18] months |
| SR 3.3.6.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| ----------REVIEWER'S NOTE---------- This SR is applied only to Functions of Table 3.3.6.2-1 with required response times not corresponding to DG start time. | | |
| SR 3.3.6.2.6 | ----------NOTE---------- [ Radiation detectors may be excluded. ] | |
| | Verify the ISOLATION SYSTEM RESPONSE TIME is within limits. | [18] months on a STAGGERED TEST BASIS INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each Secondary Containment Isolation instrumentation Function are located in the SRs column of Table 3.3.6.2-1.

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains secondary containment isolation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Action(s) taken.

This Note is based on the reliability analysis (Refs. 3 and 4) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the SCIVs will isolate the associated penetration flow paths and the SGT System will initiate when necessary.

SR 3.3.6.2.1

Performance of the CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated parameter for one instrument channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS (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 channels required by the LCO.

SR 3.3.6.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based upon the reliability analysis of References 3 and 4.

INSERT 2

SR 3.3.6.2.3

Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.2-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of References 3 and 4.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.4

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.6.2.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing, performed on SCIVs and the SGT System in LCO 3.6.4.2 and LCO 3.6.4.3, respectively, overlaps this Surveillance to provide complete testing of the assumed safety function.

INSERT 2

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.6.2.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the SCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 5.

BASES

SURVEILLANCE REQUIREMENTS (continued)

ISOLATION SYSTEM RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

----------REVIEWER'S NOTE----------
[The following Bases are applicable for plants adopting NEDO-32291-A.
---

However, the measurement of instrument loop response times may be excluded if the conditions of Reference 6 are satisfied.]

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. [The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

INSERT 2

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. NEDC-31677-P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

4. NEDC-30851-P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentations Common to RPS and ECCS Instrumentation," March 1989.

5. FSAR, Section [7.3].

[6. NEDO-32291-A, "System Analyses for the Elimination of Selected Response Time Testing Requirements," October 1995.]

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| C. As required by Required Action A.1 and referenced in Table 3.3.6.3-1. | C.1 | ----------NOTE---------- Only applicable for Functions 2 and 4. ---------- | |
| | | Declare associated RHR containment spray subsystem inoperable. | 1 hour from discovery of loss of RHR containment spray initiation capability in both trip systems |
| | AND | | |
| | C.2 | Restore channel to OPERABLE status. | 24 hours |
| D. Required Action and associated Completion Time of Condition B or C not met. | D.1 | Declare associated RHR containment spray subsystem inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.6.3-1 to determine which SRs apply for each RHR Containment Spray System Function.

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.3.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.3.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.3.3 | [ Calibrate the trip unit. | [[92] days] |
| SR 3.3.6.3.4 | [ Perform CHANNEL CALIBRATION. | [92 days] |
| SR 3.3.6.3.5 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.6.3.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RHR containment spray will initiate when necessary.

SR 3.3.6.3.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO. Insert 2

SR 3.3.6.3.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based upon the reliability analysis of Reference 3.

SR 3.3.6.3.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.3-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

Insert 2

The Frequency of 92 days is based upon the reliability analysis of Reference 3.

SR 3.3.6.3.4 and SR 3.3.6.3.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.6.3.4 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.6.3.5 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.3.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.6.1.7, "Residual Heat Removal (RHR) Containment Spray," overlaps this Surveillance to provide complete testing of the assumed safety function.

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Insert 2

REFERENCES

1. FSAR, Section [ ], Figure [ ].
2. FSAR, Section [6.2.1.1.5].
3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2 Restore channel to OPERABLE status. | 24 hours |
| D. Required Action and associated Completion Time of Condition B or C not met. | D.1 Declare associated SPMU subsystem inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.6.4-1 to determine which SRs apply for each SPMU Function.

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.4.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.6.4.2 | Perform CHANNEL FUNCTIONAL TEST. | [92] days |
| SR 3.3.6.4.3 | [ Calibrate the trip unit. | [92] days ] |
| SR 3.3.6.4.4 | [ Perform CHANNEL CALIBRATION. | 92 days ] |
| SR 3.3.6.4.5 | Perform CHANNEL CALIBRATION. | [18] months |
| SR 3.3.6.4.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [18] months |

Insert 1

BASES

ACTIONS (continued)

D.1

With any Required Action and associated Completion Time not met, the associated SPMU subsystem may be incapable of performing the intended function and the SPMU subsystem associated with inoperable, untripped channels must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

----------REVIEWER'S NOTE----------
Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.
---

As noted at the beginning of the SRs, the SRs for each SPMU System Function are located in the SRs column of Table 3.3.6.4-1.

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains suppression pool makeup capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the SPMU will initiate when necessary.

SR 3.3.6.4.1

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the required channels of the LCO.

SR 3.3.6.4.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

INSERT 2

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

SR 3.3.6.4.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.4-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.4.4 and SR 3.3.6.4.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.6.4.4 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.6.4.5 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.6.4.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.6.2.4, "Suppression Pool Makeup (SPMU) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Figure [ ].

2. FSAR, Section [6.2.7.3].

3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

## 3.3 INSTRUMENTATION

### 3.3.6.5 Relief and Low-Low Set (LLS) Instrumentation

LCO 3.3.6.5 Two relief and LLS instrumentation trip systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One trip system inoperable. | A.1 Restore trip system to OPERABLE status. | 7 days |
| B. Required Action and associated Completion Time of Condition A not met.<br><br>OR<br><br>Two trip systems inoperable. | B.1 Be in MODE 3.<br><br>AND<br><br>B.2 Be in MODE 4. | 12 hours<br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.5.1 | Perform CHANNEL FUNCTIONAL TEST. | [92] days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.6.5.2 | [ Calibrate the trip unit. | [[92] days ] |
| SR 3.3.6.5.3 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. Relief Function<br><br>Low: [1103 ± 15 psig]<br>Medium: [1113 ± 15 psig]<br>High: [1123 ± 15 psig]<br><br>b. LLS Function<br><br>Low open: [1033 ± 15 psig]<br>close: [926 ± 15 psig]<br>Medium open: [1073 ± 15 psig]<br>close [936 ± 15 psig]<br>High open: [1113 ± 15 psig]<br>close: [946 ± 15 psig] | [[18] months |
| SR 3.3.6.5.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated the 6 hour testing allowance does not significantly reduce the probability that the relief and LLS valves will initiate when necessary.

SR 3.3.6.5.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

INSERT 2

SR 3.3.6.5.2

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in SR 3.3.6.5.3. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.5.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

INSERT 2

SR 3.3.6.5.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed for S/RVs in LCO 3.4.4 and LCO 3.6.1.6 overlaps this Surveillance to provide complete testing of the assumed safety function. 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Section [5.2.2].
2. FSAR, Appendix 5A.
3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.7.1.1 | Perform CHANNEL CHECK. | [12 hours |
| SR 3.3.7.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [[92] days |
| SR 3.3.7.1.3 | [ Calibrate the trip units. | [[92] days ] |
| SR 3.3.7.1.4 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.7.1.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated *Function maintains* CRFA System initiation capability. Upon completion of the surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 4, 5, and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the CRFA System will initiate when necessary.

SR 3.3.7.1.1

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 indicated parameter for one instrument channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

INSERT 2

The Frequency is based upon operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel status during normal operational use of the displays associated with channels required by the LCO.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of References 4, 5, and 6.

INSERT 2

SR 3.3.7.1.3

The calibration of trip units provides a check of the actual trip setpoints. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of References 4, 5, and 6.

SR 3.3.7.1.4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.7.1.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.7.3, "Control Room Fresh Air (CRFA) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

INSERT 2

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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Figure [ ].
2. FSAR, Section [6.4].
3. FSAR, Chapter [15].
4. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A, Supplement 2, "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

## 3.3 INSTRUMENTATION

### 3.3.8.1 Loss of Power (LOP) Instrumentation

LCO 3.3.8.1 The LOP instrumentation for each Function in Table 3.3.8.1-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
When the associated diesel generator (DG) is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more channels inoperable. | A.1 Place channel in trip. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 Declare associated DG inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTES----------
1. Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains DG initiation capability.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.1.1 | [ Perform CHANNEL CHECK. | [12 hours] Insert 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.1.2 | Perform CHANNEL FUNCTIONAL TEST. | [31 days |
| SR 3.3.8.1.3 | Perform CHANNEL CALIBRATION. | [[18] months |
| SR 3.3.8.1.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each LOP Instrumentation Function are located in the SRs column of Table 3.3.8.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains DG initiation capability. Upon completion of the Surveillance, or expiration of the 2 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken.

SR 3.3.8.1.1

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

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the required channels of the LCO.

INSERT 2

SR 3.3.8.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required

BASES

SURVEILLANCE REQUIREMENTS (continued)

contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 31 days is based on plant operating experience with regard to channel OPERABILITY and drift that demonstrates that failure of more than one channel of a given Function in any 31 day interval is rare.

SR 3.3.8.1.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

INSERT 2

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

SR 3.3.8.1.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed in LCO 3.8.1 and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety functions.

The 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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | D.2.1 Initiate action to restore one electric power monitoring assembly to OPERABLE status for inservice power supply(s) supplying required instrumentation. | Immediately |
| | OR | |
| | D.2.2 [ Initiate action to isolate the Residual Heat Removal Shutdown Cooling System. | Immediately ] |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.2.1 | ----------NOTE---------- Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours. ---------- | |
| | Perform CHANNEL FUNCTIONAL TEST. | [184 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.2.2 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. Overvoltage<br><br>Bus A ≤ [132.9] V<br>Bus B ≤ [133.0] V<br><br>b. Undervoltage<br><br>Bus A ≥ [115.0] V<br>Bus B ≥ [115.9] V<br><br>c. Underfrequency (with time delay set to [zero])<br><br>Bus A ≥ [57] Hz<br>Bus B ≥ [57] Hz | [18] months |
| SR 3.3.8.2.3 | Perform a system functional test. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1, D.2.1, and D.2.2

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 4 or 5, with any control rod withdrawn from a core cell containing one or more fuel assemblies or with both RHR shutdown cooling valves open, the operator must immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies (Required Action D.1). This Required Action results in the least reactive condition for the reactor core and ensures that the safety function of the RPS (e.g., scram of control rods) is not required.

In addition, action must be immediately initiated to either restore one electric power monitoring assembly to OPERABLE status for the inservice power source supplying the required instrumentation powered from the RPS bus (Required Action D.2.1) or to isolate the RHR Shutdown Cooling System (Required Action D.2.2). Required Action D.2.1 is provided because the RHR Shutdown Cooling System may be needed to provide core cooling. All actions must continue until the applicable Required Actions are completed.

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.1

A CHANNEL FUNCTIONAL TEST is performed on each overvoltage, undervoltage, and underfrequency channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

As noted in the Surveillance, the CHANNEL FUNCTIONAL TEST is only required to be performed while the plant is in a condition in which the loss of the RPS bus will not jeopardize steady state power operation (the design of the system is such that the power source must be removed from service to conduct the Surveillance). The 24 hours is intended to indicate an outage of sufficient duration to allow for scheduling and proper performance of the Surveillance. The 184 day Frequency and the Note in the Surveillance are based on guidance provided in Generic Letter 91-09 (Ref. 2). is

[The 184 day Frequency is based on Reference 2. ← Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.2.2

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.8.2.3

Performance of a system functional test demonstrates a required system actuation (simulated or actual) signal. The logic of the system will automatically trip open the associated power monitoring assembly circuit breaker. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E circuit breakers is included as part of this test to provide complete testing of the safety function. If the breakers are incapable of operating, the associated electric power monitoring assembly would be inoperable.

INSERT 2

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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Section [8.3.1.1.5].

2. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electric Protective Assemblies in Power Supplies for the Reactor Protection System."

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Required Action and associated Completion Time of Condition A not met.<br><br>OR<br><br>No recirculation loops in operation. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

transition during a LOCA is reduced. A larger flow mismatch can therefore be allowed when core flow is < [70]% of rated core flow. The recirculation loop jet pump flow, as used in this Surveillance, is the summation of the flows from all of the jet pumps associated with a single recirculation loop.

INSERT 2

The mismatch is measured in terms of percent of rated core flow. If the flow mismatch exceeds the specified limits, the loop with the lower flow is considered inoperable. This SR is not required when both loops are not in operation since the mismatch limits are meaningless during single loop or natural circulation operation. The Surveillance must be performed within 24 hours after both loops are in operation. The 24 hour Frequency is consistent with the Frequency for jet pump OPERABILITY verification and has been shown by operating experience to be adequate to detect off normal jet pump loop flows in a timely manner.

REFERENCES

1. FSAR, Section [6.3.3.4].
2. FSAR, Section [5.5.1.4].
3. [Plant specific analysis for single loop operation. ]

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.2 Flow Control Valves (FCVs)

LCO 3.4.2 A recirculation loop FCV shall be OPERABLE in each operating recirculation loop.

APPLICABILITY: MODES 1 and 2.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each FCV.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or two required FCVs inoperable. | A.1 Lock up the FCV. | 4 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.2.1 | Verify each FCV fails "as is" on loss of hydraulic pressure at the hydraulic unit. | [18] months |
| SR 3.4.2.2 | Verify average rate of each FCV movement is:<br>a. ≤ [11]% of stroke per second for opening and<br>b. ≤ [11]% of stroke per second for closing. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1

Hydraulic power unit pilot operated isolation valves located between the servo valves and the common "open" and "close" lines are required to close in the event of a loss of hydraulic pressure. When closed, these valves inhibit FCV motion by blocking hydraulic pressure from the servo valve to the common open and close lines as well as to the alternate subloop. This Surveillance verifies FCV lockup on a loss of hydraulic pressure.

[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. Operating experience has shown 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.

INSERT 2

SR 3.4.2.2

This SR ensures the overall average rate of FCV movement at all positions is maintained within the analyzed limits.

[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. Operating experience has shown 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.

REFERENCES

1. FSAR, Section [15.3.2].
2. FSAR, Section [15.4.5].
[ 3. Plant specific Safety Evaluation Report. ]

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.3.1 | ----------NOTES----------<br>1. Not required to be performed until 4 hours after associated recirculation loop is in operation.<br>2. Not required to be performed until 24 hours after > 25% RTP.<br>----------<br><br>Verify at least two of the following criteria (a, b, and c) are satisfied for each operating recirculation loop:<br><br>a. Recirculation loop drive flow versus flow control valve position differs by≤ 10% from established patterns.<br><br>b. Recirculation loop drive flow versus total core flow differs by ≤ 10% from established patterns.<br><br>c. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns, or each jet pump flow differs by ≤ 10% from established patterns. | ≤ 24 hours INSERT 1 |

----------REVIEWER'S NOTE----------
An acceptable option to these criteria for jet pump OPERABILITY can be found in the BWR/4 STS, NUREG-1433.
---

BASES

SURVEILLANCE REQUIREMENTS (continued)

relationships may need to be re-established each cycle. Similarly, initial entry into extended single loop operation may also require establishment of these relationships. During the initial weeks of operation under such conditions, while baselining new "established patterns", engineering judgement of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.

The recirculation flow control valve (FCV) operating characteristics (loop flow versus FCV position) are determined by the flow resistance from the loop suction through the jet pump nozzles. A change in the relationship indicates a flow restriction, loss in pump hydraulic performance, leak, or new flow path between the recirculation pump discharge and jet pump nozzle. For this criterion, the loop flow versus FCV position relationship must be verified.

Total core flow can be determined from measurements of the recirculation loop drive flows. Once this relationship has been established, increased or reduced total core flow for the same recirculation loop drive flow may be an indication of failures in one or several jet pumps.

Individual jet pumps in a recirculation loop typically do not have the same flow. The unequal flow is due to the drive flow manifold, which does not distribute flow equally to all risers. The flow (or jet pump diffuser to lower plenum differential pressure) pattern or relationship of one jet pump to the loop average is repeatable. An appreciable change in this relationship is an indication that increased (or reduced) resistance has occurred in one of the jet pumps. This may be indicated by an increase in the relative flow for a jet pump that has experienced beam cracks.

The deviations from normal are considered indicative of a potential problem in the recirculation drive flow or jet pump system (Ref. 2). Normal flow ranges and established jet pump flow and differential pressure patterns are established by plotting historical data as discussed in Reference 2.

The 24 hour Frequency has been shown by operating experience to be adequate to verify jet pump OPERABILITY and is consistent with the Frequency for recirculation loop OPERABILITY verification. INSERT 2

This SR is modified by two Notes. Note 1 allows this Surveillance not to be performed until 4 hours after the associated recirculation loop is in operation, since these checks can only be performed during jet pump operation. The 4 hours is an acceptable time to establish conditions appropriate for data collection and evaluation.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.4.1 | ----------NOTE----------<br>≤ [2] [required] S/RVs may be changed to a lower setpoint group.<br>----------<br><br>Verify the safety function lift setpoints of the [required] S/RVs are as follows:<br><br>Number of S/RVs — Setpoint (psig)<br>[8] — [1165 ± 34.9]<br>[6] — [1180 ± 35.4]<br>[6] — [1190 ± 35.7]<br><br>Following testing, lift settings shall be within ± 1%. | [In accordance with the Inservice Testing Program or [18] months]<br>Insert 1 |
| SR 3.4.4.2 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br><br>Verify each [required] relief function S/RV actuates on an actual or simulated automatic initiation signal. | [18] months |
| SR 3.4.4.3 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each [required] S/RV opens when manually actuated. | [18] months on a STAGGERED TEST BASIS for each valve solenoid<br>INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

This Surveillance demonstrates that the [required] S/RVs will open at the pressures assumed in the safety analysis of Reference 2. The demonstration of the S/RV safety function lift settings must be performed during shutdown, since this is a bench test[, and in accordance with the Inservice Testing Program]. The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures. The S/RV setpoint is ± [3]% for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. [A Note is provided to allow up to [two] of the required [11] S/RVs to be physically replaced with S/RVs with lower setpoints. This provides operational flexibility which maintains the assumptions in the over-pressure analysis.]

The [18 month] Frequency was selected because this Surveillance must be performed during shutdown conditions and is based on the time between refuelings.

Insert 2

SR 3.4.4.2

The [required] relief function S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify the mechanical portions of the automatic relief function operate as designed when initiated either by an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.5.4 overlaps this SR to provide complete testing of the safety function.

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. Operating experience has shown 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.

INSERT 2

This SR is modified by a Note that excludes valve actuation. This prevents an RPV pressure blowdown.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.4.3

A manual actuation of each [required] S/RV is performed to verify that, mechanically, the valve is functioning properly and no blockage exists in the valve discharge line. This can be demonstrated by the response of the turbine control valves or bypass valves, by a change in the measured steam flow, or any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the S/RVs divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this test. Adequate pressure at which this test is to be performed is 950 psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. Plant startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed for manual actuation after the required pressure is reached is sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR. If the valve fails to actuate due only to the failure of the solenoid but is capable of opening on overpressure, the safety function of the S/RV is considered OPERABLE.

[The [18] month on a STAGGERED TEST BASIS Frequency ensures that each solenoid for each S/RV is alternately tested. The 18 month Frequency was developed based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 1). Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. ASME, Boiler and Pressure Vessel Code, Section III.

2. FSAR, Section [5.2.5.5.3].

3. FSAR, Section [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time of Condition A or B not met.<br><br>OR<br><br>Pressure boundary LEAKAGE exists. | C.1 Be in MODE 3.<br><br>AND<br><br>C.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.5.1 | Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits. | [8 hours INSERT 1 |

BASES

ACTIONS (continued)

B.1 and B.2

An unidentified LEAKAGE increase of > 2 gpm within a 4 hour period is an indication of a potential flaw in the RCPB and must be quickly evaluated. Although the increase does not necessarily violate the absolute unidentified LEAKAGE limit, certain susceptible components must be determined not to be the source of the LEAKAGE increase within the required Completion Time. For an unidentified LEAKAGE increase greater than required limits, an alternative to reducing LEAKAGE increase to within limits (i.e., reducing the leakage rate such that the current rate is less than the "2 gpm increase in the previous [4] hours" limit; either by isolating the source or other possible methods) is to evaluate RCS type 304 and type 316 austenitic stainless steel piping that is subject to high stress or that contains relatively stagnant or intermittent flow fluids and determine it is not the source of the increased LEAKAGE. This type of piping is very susceptible to IGSCC.

The 4 hour Completion Time is needed to properly reduce the LEAKAGE increase or verify the source before the reactor must be shut down.

C.1 and C.2

If any Required Action and associated Completion Time of Condition A or B is not met or if pressure boundary LEAKAGE exists, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

The RCS LEAKAGE is monitored by a variety of instruments designed to provide alarms when LEAKAGE is indicated and to quantify the various types of LEAKAGE. Leakage detection instrumentation is discussed in more detail in the Bases for LCO 3.4.7, "RCS Leakage Detection Instrumentation." Sump level and flow rate are typically monitored to determine actual LEAKAGE rates. However, any method may be used to quantify LEAKAGE within the guidelines of Reference 7. In conjunction with alarms and other administrative controls, an 8 hour Frequency for this Surveillance is appropriate for identifying changes in LEAKAGE and for tracking required trends (Ref. 8).

INSERT 2

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2 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 |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.6.1 | ----------NOTE----------<br>Not required to be performed in MODE 3.<br>----------<br><br>Verify equivalent leakage of each RCS PIV is ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm, at an RCS pressure ≥ [1040] psig and ≤ [1060] psig. | [In accordance with Inservice Testing Program or [18] months] |

Insert 1

BASES

ACTIONS (continued)

B.1 and B.2

If leakage cannot be reduced or the system isolated, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. This action may reduce the leakage and also reduces the potential for a LOCA outside the containment. The Completion Times are reasonable, based on operating experience, to achieve the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

Performance of leakage testing on each RCS PIV 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. 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.

The 18 month Frequency required by the Inservice Testing Program is within the ASME Code, Section XI, Frequency requirement and is based on the need to perform this Surveillance 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 2

Therefore, this SR is modified by a Note that states the leakage Surveillance is not required to be performed in MODE 3. Entry into MODE 3 is permitted for leakage testing at high differential pressures with stable conditions not possible in the lower MODES.

REFERENCES

1. 10 CFR 50.2.
2. 10 CFR 50.55a(c).
3. 10 CFR 50, Appendix A, GDC 55.
4. ASME, Boiler and Pressure Vessel Code, Section XI.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. [ Drywell air cooler condensate flow rate monitoring system inoperable. | ----------NOTE---------- Not applicable when the required drywell atmospheric monitoring system is inoperable. ---------- | |
| | C.1 Perform SR 3.4.7.1. | Once per 8 hours ] |
| D. [ Required drywell atmospheric monitoring system inoperable. | D.1 Restore required drywell atmospheric monitoring system to OPERABLE status. | 30 days |
| AND | OR | |
| Drywell air cooler condensate flow rate monitoring system inoperable. | D.2 Restore drywell air cooler condensate flow rate monitoring system to OPERABLE status. | 30 days ] |
| E. Required Action and associated Completion Time of Condition A, B, [C, or D] not met. | E.1 Be in MODE 3. | 12 hours |
| | AND | |
| | E.2 Be in MODE 4. | 36 hours |
| F. All required leakage detection systems inoperable. | F.1 Enter LCO 3.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.7.1 | Perform CHANNEL CHECK of required drywell atmospheric monitoring system. | [12 hours |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.7.2 | Perform CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation. | [31 days |
| SR 3.4.7.3 | Perform CHANNEL CALIBRATION of required leakage detection instrumentation. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires the performance of a CHANNEL CHECK of the required drywell atmospheric monitoring system. The check gives reasonable confidence that the channel is operating properly. The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.

SR 3.4.7.2

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the required RCS leakage detection instrumentation. The test ensures that the monitors can perform their function in the desired manner. The test also verifies the alarm setpoint and relative accuracy of the instrument string. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Frequency of 31 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.

INSERT 2

SR 3.4.7.3

This SR requires the performance of a CHANNEL CALIBRATION of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside the drywell. The Frequency of [18] months is a typical refueling cycle and considers channel reliability. Operating experience has proven this Frequency is acceptable.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. Regulatory Guide 1.45, May 1973.
3. FSAR, Section [5.2.5.2].
4. GEAP-5620, April 1968.
5. NUREG-75/067, October 1975.
6. FSAR, Section [5.2.5.5.3].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.2.2.2 Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.8.1 | ----------NOTE----------<br>Only required to be performed in MODE 1.<br>----------<br><br>Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ [0.2] μCi/gm. | [7 days INSERT 1 |

BASES

ACTIONS (continued)

Alternately, the plant can be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. This option is provided for those instances when isolation of main steam lines is not desired (e.g., due to the decay heat loads). In MODE 4, the requirements of the LCO are no longer applicable.

The Completion Time of once every 4 hours is the time needed to take and analyze a sample. The 12 hour Completion Time is reasonable, based on operating experience, to isolate the main steam lines in an orderly manner and without challenging plant systems. Also, the allowed Completion Times for Required Actions B.2.2.1 and B.2.2.2 for bringing the plant to MODES 3 and 4 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 3.4.8.1

This Surveillance is performed to ensure iodine remains within limit during normal operation. The 7 day Frequency is adequate to trend changes in the iodine activity level. INSERT 2

This SR is modified by a Note that requires this Surveillance to be performed only in MODE 1 because the level of fission products generated in other MODES is much less.

REFERENCES

1. 10 CFR 100.11, 1973.

2. FSAR, Section [15.1.40].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.9.1 | ----------NOTE----------<br>Not required to be met until 2 hours after reactor steam dome pressure is < [the RHR cut in permissive pressure].<br>----------<br><br>Verify one RHR shutdown cooling subsystem or recirculation pump is operating. | [12 hours INSERT 1 |

BASES

ACTIONS (continued)

B.1, B.2, and B.3

With no RHR shutdown cooling subsystem and no recirculation pump in operation, except as is permitted by LCO Note 1, reactor coolant circulation by the RHR shutdown cooling subsystem or one recirculation pump must be restored without delay.

Until RHR or recirculation pump operation is re-established, an alternate method of reactor coolant circulation must be placed into service. This will provide the necessary circulation for monitoring coolant temperature. The 1 hour Completion Time is based on the coolant circulation function and is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation. Furthermore, verification of the functioning of the alternate method must be reconfirmed every 12 hours thereafter. This will provide assurance of continued temperature monitoring capability.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR shutdown cooling subsystem or recirculation pump), the reactor coolant temperature and pressure must be periodically monitored to ensure proper function of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room. Insert 2

This Surveillance is modified by a Note allowing sufficient time to align the RHR System for shutdown cooling operation after clearing the pressure interlock that isolates the system, or for placing a recirculation pump in operation. The Note takes exception to the requirements of the Surveillance being met (i.e., forced coolant circulation is not required for this initial 2 hour period), which also allows entry into the Applicability of this Specification in accordance with SR 3.0.4 since the Surveillance will not be "not met" at the time of entry into the Applicability.

REFERENCES None.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. No RHR shutdown cooling subsystem in operation.<br><br>AND<br><br>No recirculation pump in operation. | B.1 Verify reactor coolant circulating by an alternate method.<br><br>AND<br><br>B.2 Monitor reactor coolant temperature and pressure. | 1 hour from discovery of no reactor coolant circulation<br><br>AND<br><br>Once per 12 hours thereafter<br><br>Once per hour |

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.4.10.1 | Verify one RHR shutdown cooling subsystem or recirculation pump is operating. | 12 hours INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room. INSERT 2

REFERENCES

None.

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.4.11.1 | ----------NOTE----------<br>Only required to be performed during RCS heatup and cooldown operations, and RCS inservice leak and hydrostatic testing.<br>----------<br><br>Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR. | [30 minutes INSERT 1 |
| SR 3.4.11.2 | Verify RCS pressure and RCS temperature are within the criticality limits specified in the PTLR. | Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality |
| SR 3.4.11.3 | ----------NOTE----------<br>Only required to be met in MODES 1, 2, 3, and 4 during recirculation pump startup [with reactor steam dome pressure ≥ 25 psig].<br>----------<br><br>Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is within the limits specified in the PTLR. | Once within 15 minutes prior to each startup of a recirculation pump |
| SR 3.4.11.4 | ----------NOTE----------<br>Only required to be met in MODES 1, 2, 3, and 4 during recirculation pump startup.<br>----------<br><br>Verify the difference between the reactor coolant temperature in the recirculation loop to be started and the RPV coolant temperature is within the limits specified in the PTLR. | Once within 15 minutes prior to each startup of a recirculation pump |

SURVEILLANCE REQUIREMENTS (continued)

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.4.11.5 | ----------NOTE----------<br>[ Only required to be met during a THERMAL POWER increase or recirculation flow increase in MODES 1 and 2 with one idle recirculation loop when [THERMAL POWER is ≤ 30% RTP or when operating loop flow is ≤ 50% rated loop flow].<br>----------<br><br>Verify the difference between the bottom head coolant temperature and the RPV coolant temperature is [≤ 145°F]. | Once within 15 minutes prior to a THERMAL POWER increase or recirculation flow increase ] |
| SR 3.4.11.6 | ----------NOTE----------<br>[ Only required to be met during a THERMAL POWER increase or recirculation flow increase in MODES 1 and 2 with one non-isolated idle recirculation loop when [THERMAL POWER is ≤ 30% RTP or when operating loop flow is ≤ 50% rated loop flow].<br>----------<br><br>Verify the difference between the reactor coolant temperature in the idle recirculation loop and the RPV coolant temperature is [≤ 50°F]. | Once within 15 minutes prior to a THERMAL POWER increase or recirculation flow increase ] |
| SR 3.4.11.7 | ----------NOTE----------<br>Only required to be performed when tensioning the reactor vessel head bolting studs.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR. | [30 minutes INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.11.8 | ----------NOTE----------<br>Not required to be performed until 30 minutes after RCS temperature ≤ 80°F in MODE 4.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR. | [30 minutes |
| SR 3.4.11.9 | ----------NOTE----------<br>Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR. | [12 hours |

INSERT 1

BASES

ACTIONS (continued)

B.1 and B.2

If a Required Action and associated Completion Time of Condition A are not met, the plant must be brought to a lower MODE because either the RCS remained in an unacceptable P/T region for an extended period of increased stress, or a sufficiently severe event caused entry into an unacceptable region. Either possibility indicates a need for more careful examination of the event, best accomplished with the RCS at reduced pressure and temperature. With the reduced pressure and temperature conditions, the possibility of propagation of undetected flaws is decreased.

Pressure and temperature are reduced by bringing the plant to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

Operation outside the P/T limits in other than MODES 1, 2, and 3 (including defueled conditions) must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses. The Required Action must be initiated without delay and continued until the limits are restored.

Besides restoring the P/T limit parameters to within limits, an evaluation is required to determine if RCS operation is allowed. This evaluation must verify that the RCPB integrity is acceptable and must be completed before approaching criticality or heating up to > 200°F. Several methods may be used, including comparison with pre-analyzed transients, new analyses, or inspection of the components. ASME Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Verification that operation is within 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 of minor deviations. INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

Performing the Surveillance within 15 minutes before starting the idle recirculation pump, THERMAL POWER increase during single loop operation, or recirculation flow increase during single loop operation, provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the idle pump start, power increase, or flow increase. ]

An acceptable means of demonstrating compliance with the temperature differential requirement in SR 3.4.11.4 [and SR 3.4.11.6] is to compare the temperatures of the operating recirculation loop and the idle loop.

[SR 3.4.11.3 has] These SRs have been modified by [a Note] [Notes] that require[s] the Surveillance to be met only in [MODES 1, 2, 3, and 4 with reactor steam dome pressure ≥ 25 psig]. In MODE 5, the overall stress on limiting components is lower; therefore, ΔT limits are not required [for SRs 3.4.11.3 and 3.4.11.4 in MODE 5. In MODES 3, 4, and 5, THERMAL POWER increases are not possible, and recirculation flow increases will not result in additional stresses. Therefore, ΔT limits are only required for SRs 3.4.11.5 and 3.4.11.6 in MODES 1 and 2]. The [Note][Notes] also state that the SR is only required to be met during the event of concern (e.g., pump startup, power increase or flow increase) since this is when the stresses occur.

SR 3.4.11.7, SR 3.4.11.8, and SR 3.4.11.9

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

The flange temperatures must be verified to be above the limits 30 minutes before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. When in MODE 4 with RCS temperature ≤ 80°F, 30 minute checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 100°F, monitoring of the flange temperature is required every 12 hours to ensure the temperatures are within the limits specified in the PTLR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

INSERT 2

REFERENCES

1. 10 CFR 50, Appendix G.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
3. ASTM E 185-82, July 1982.
4. 10 CFR 50, Appendix H.
5. Regulatory Guide 1.99, Revision 2, May 1988.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. NEDO-21778-A, December 1978.
[ 8. FSAR, Section [15.1.26]. ]

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.12 Reactor Steam Dome Pressure

LCO 3.4.12 The reactor steam dome pressure shall be ≤ [1045] psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Reactor steam dome pressure not within limit. | A.1 Restore reactor steam dome pressure to within limit. | 15 minutes |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.12.1 | Verify reactor steam dome pressure is ≤ [1045] psig. | [12 hours INSERT 1 |

BASES

ACTIONS

A.1

With the reactor steam dome pressure greater than the limit, prompt action should be taken to reduce pressure to below the limit and return the reactor to operation within the bounds of the analyses. The 15 minute Completion Time is reasonable considering the importance of maintaining the pressure within limits. This Completion Time also ensures that the probability of an accident while pressure is greater than the limit is minimal. If the operator is unable to restore the reactor steam dome pressure to below the limit, then the reactor should be brought to MODE 3 to be within the assumptions of the transient analyses.

B.1

If the reactor steam dome pressure cannot be restored to within the limit within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1

Verification that reactor steam dome pressure is ≤ [1045] psig ensures that the initial conditions of the DBAs and transients are met. Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions. INSERT 2

REFERENCES

1. FSAR, Section [5.2.2.2.4].
2. FSAR, Section [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| H. HPCS and low pressure core spray (LPCS) inoperable.<br><br>OR<br><br>Three or more ECCS injection/spray subsystems inoperable.<br><br>OR<br><br>HPCS System and one or more ADS valves inoperable.<br><br>OR<br><br>Two or more ECCS injection/spray subsystems and one or more ADS valves inoperable. | H.1 Enter LCO 3.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.1 | Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve. | [31 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.2 | Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.5.1.3 | Verify ADS [air receiver] pressure is ≥ [150] psig. | [31 days |
| SR 3.5.1.4 | Verify each ECCS pump develops the specified flow rate [against a system head corresponding to the specified reactor pressure].<br><br>System / Flow Rate / [System Head Corresponding to a Reactor Pressure of]<br>LPCS / ≥ [7115] gpm / ≥ [290] psig<br>LPCI / ≥ [7450] gpm / ≥ [125] psig<br>HPCS / ≥ [7115] gpm / ≥ [445] psig | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.5.1.5 | ----------NOTE----------<br>Vessel injection/spray may be excluded.<br>----------<br><br>Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal. | [[18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.6 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br><br>Verify the ADS actuates on an actual or simulated automatic initiation signal. | [18] months |
| SR 3.5.1.7 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each ADS valve opens when manually actuated. | [18] months on a STAGGERED TEST BASIS for each valve solenoid |

INSERT 1

BASES

ACTIONS (continued)

H.1

When multiple ECCS subsystems are inoperable, as stated in Condition H, the plant is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge lines of the HPCS System, LPCS System, and LPCI subsystems full of water ensures that the systems will perform properly, injecting their full capacity into the RCS upon demand. This will also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring the lines are full is to vent at the high points. The 31 day Frequency is based on operating experience, on the procedural controls governing system operation, and on the gradual nature of void buildup in the ECCS piping.

SR 3.5.1.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves potentially 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 of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve alignment would only affect a single subsystem. This Frequency has been shown to be acceptable through operating experience.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.3

Verification every 31 days that ADS air receiver pressure is ≥ [150] psig assures adequate air pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The designed pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least two valve actuations can occur with the drywell at 70% of design pressure (Ref. 14). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of [150] psig is provided by the ADS Instrument Air Supply System. [The 31 day Frequency takes into consideration administrative control over operation of the Instrument Air Supply System and alarms for low air pressure. INSERT 2

SR 3.5.1.4

The performance requirements of the ECCS pumps are determined through application of the 10 CFR 50, Appendix K, criteria (Ref. 8). This periodic Surveillance is performed (in accordance with the ASME Code, Section XI, requirements for the ECCS pumps) to verify that the ECCS pumps will develop the flow rates required by the respective analyses. The ECCS pump flow rates ensure that adequate core cooling is provided to satisfy the acceptance criteria of 10 CFR 50.46 (Ref. 10).

The pump flow rates are verified against a system head that is equivalent to the RPV pressure expected during a LOCA. The total system pump outlet pressure is adequate to overcome the elevation head pressure between the pump suction and the vessel discharge, the piping friction losses, and RPV pressure present during LOCAs. These values may be established during pre-operational testing. [A 92 day Frequency for this Surveillance is in accordance with the Inservice Testing Program requirements.

Insert 2

SR 3.5.1.5

The ECCS subsystems are required to actuate automatically to perform their design functions. This Surveillance test verifies that, with a required system initiation signal (actual or simulated), the automatic initiation logic of HPCS, LPCS, and LPCI will cause the systems or subsystems to operate as designed, including actuation of the system throughout its emergency operating sequence, automatic pump startup, and actuation of

BASES

SURVEILLANCE REQUIREMENTS (continued)

all automatic valves to their required positions. This Surveillance also ensures that the HPCS System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlaps this Surveillance to provide complete testing of the assumed safety function.

The 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. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2 This SR is modified by a Note that excludes vessel injection/spray during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

SR 3.5.1.6

The ADS designated S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to demonstrate that the mechanical portions of the ADS function (i.e., solenoids) operate as designed when initiated either by an actual or simulated initiation signal, causing proper actuation of all the required components. SR 3.5.1.7 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

The 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. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

This SR is modified by a Note that excludes valve actuation. This prevents an RPV pressure blowdown.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.7

A manual actuation of each ADS valve is performed to verify that the valve and solenoids are functioning properly and that no blockage exists in the S/RV discharge lines. This is demonstrated by the response of the turbine control or bypass valve, by a change in the measured steam flow, or by any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the ADS valves divert steam flow upon opening. Sufficient time is therefore allowed, after the required pressure and flow are achieved, to perform this test. Adequate pressure at which this test is to be performed is [950] psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. Reactor startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. SR 3.5.1.6 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

The Frequency of 18 months on a STAGGERED TEST BASIS ensures that both solenoids for each ADS valve are alternately tested. The Frequency is based on the need to perform this Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

REFERENCES

1. FSAR, Section [6.3.2.2.3].
2. FSAR, Section [6.3.2.2.4].
3. FSAR, Section [6.3.2.2.1].
4. FSAR, Section [6.3.2.2.2].
5. FSAR, Section [15.2.8].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| D. Required Action C.2 and associated Completion Time not met. | D.1 | Initiate action to restore [secondary containment] to OPERABLE status. | Immediately |
| | AND | | |
| | D.2 | [ Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately ] |
| | AND | | |
| | D.3 | Initiate action to restore isolation capability in each required [secondary containment] penetration flow path not isolated. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.1 | Verify, for each required low pressure ECCS injection/spray subsystem, the suppression pool water level is ≥ [12.67 ft]. | [12 hours |
| SR 3.5.2.2 | Verify, for the required High Pressure Core Spray (HPCS) System, the:<br>a. Suppression pool water level is ≥ [12.67 ft] or<br>b. Condensate storage tank water level is ≥ [18 ft]. | [12 hours |
| SR 3.5.2.3 | Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.4 | Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days] |
| SR 3.5.2.5 | Verify each required ECCS pump develops the specified flow rate [against a system head corresponding to the specified reactor pressure].<br><br>System / Flow Rate / [System Head Corresponding to a Reactor Pressure of]<br>LPCS / ≥ [7115] gpm / ≥ [290] psig<br>LPCI / ≥ [7450] gpm / ≥ [125] psig<br>HPCS / ≥ [7115] gpm / ≥ [445] psig | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.5.2.6 | ----------NOTE----------<br>Vessel injection/spray may be excluded.<br>----------<br><br>Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal. | [18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

When the suppression pool level is < [12.67 ft], the HPCS System is considered OPERABLE only if it can take suction from the CST and the CST water level is sufficient to provide the required NPSH for the HPCS pump. Therefore, a verification that either the suppression pool water level is ≥ [12.67 ft] or the HPCS System is aligned to take suction from the CST and the CST contains ≥ [170,000] gallons of water, equivalent to 18 ft, ensures that the HPCS System can supply makeup water to the RPV.

The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool and CST water level variations and instrument drift during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to an abnormal suppression pool or CST water level condition.

INSERT 2

SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6

The Bases provided for SR 3.5.1.1, SR 3.5.1.4, and SR 3.5.1.5 are applicable to SR 3.5.2.3, SR 3.5.2.5, and SR 3.5.2.6, respectively.

SR 3.5.2.4

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 valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. The 31 day Frequency is appropriate because the valves are operated under procedural control and the probability of their being mispositioned during this time period is low.

REFERENCES 1. FSAR, Section [6.3.3.4].

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.5.3.1 | Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve. | [31 days |
| SR 3.5.3.2 | Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.5.3.3 | ----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- | |
| | Verify, with [RCIC steam supply pressure] ≤ [1045] psig and ≥ [945] psig, the RCIC pump can develop a flow rate ≥ [800] gpm [against a system head corresponding to reactor pressure]. | [92 days |
| SR 3.5.3.4 | ----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- | |
| | Verify, with [RCIC steam supply pressure] ≤ [165] psig, the RCIC pump can develop a flow rate ≥ [800] gpm [against a system head corresponding to reactor pressure]. | [18] months |
| SR 3.5.3.5 | ----------NOTE---------- Vessel injection may be excluded. ---------- | |
| | Verify the RCIC System actuates on an actual or simulated automatic initiation signal. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

Condition B must be immediately entered. For transients and certain abnormal events with no LOCA, RCIC (as opposed to HPCS) is the preferred source of makeup coolant because of its relatively small capacity, which allows easier control of RPV water level. Therefore, a limited time is allowed to restore the inoperable RCIC to OPERABLE status.

The 14 day Completion Time is based on a reliability study (Ref. 3) that evaluated the impact on ECCS availability, assuming that various components and subsystems were taken out of service. The results were used to calculate the average availability of ECCS equipment needed to mitigate the consequences of a LOCA as a function of allowed outage times (AOTs). Because of the similar functions of the HPCS and RCIC, the AOTs (i.e., Completion Times) determined for the HPCS are also applied to RCIC.

B.1 and B.2

If the RCIC System cannot be restored to OPERABLE status within the associated Completion Time, or if the HPCS System is simultaneously inoperable, the plant must be brought to a condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and reactor steam dome pressure reduced to ≤ 150 psig within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge line of the RCIC System full of water ensures that the system will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. This will also prevent a water hammer following an initiation signal. One acceptable method of ensuring the line is full is to vent at the high points. The 31 day Frequency is based on the gradual nature of void buildup in the RCIC piping, the procedural controls governing system operation, and operating experience.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.2

Verifying the correct alignment for manual, power operated, and automatic valves in the RCIC flow path provides assurance that the proper flow path will exist for RCIC operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. For the RCIC System, this SR also includes the steam flow path for the turbine and the flow controller position.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve position would affect only the RCIC System. This Frequency has been shown to be acceptable through operating experience. INSERT 2

SR 3.5.3.3 and SR 3.5.3.4

The RCIC pump flow rates ensure that the system can maintain reactor coolant inventory during pressurized conditions with the RPV isolated. The flow tests for the RCIC System are performed at two different pressure ranges such that system capability to provide rated flow is tested both at the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the RCIC System diverts steam flow. Reactor steam pressure must be ≥ [920] psig to perform SR 3.5.3.3 and ≥ [150] psig to perform SR 3.5.3.4. Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr. Therefore, sufficient time is allowed after adequate pressure and flow are achieved to perform these SRs. Reactor startup is allowed prior to performing the low pressure Surveillance because the reactor pressure is low and the time to satisfactorily perform the Surveillance is short. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed

BASES

SURVEILLANCE REQUIREMENTS (continued)

that the low pressure test has been satisfactorily completed and there is no indication or reason to believe that RCIC is inoperable. Therefore, these SRs are modified by Notes that state the Surveillances are not required to be performed until 12 hours after the reactor steam pressure and flow are adequate to perform the test.

A 92 day Frequency for SR 3.5.3.3 is consistent with the Inservice Testing Program requirements. The 18 month Frequency for SR 3.5.3.4 is based on the need to perform this Surveillance under the conditions that apply just prior to or during startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

SR 3.5.3.5

The RCIC System is required to actuate automatically to perform its design function. This Surveillance verifies that with a required system initiation signal (actual or simulated) the automatic initiation logic of RCIC will cause the system to operate as designed, including actuation of the system throughout its emergency operating sequence, automatic pump startup and actuation of all automatic valves to their required positions. This Surveillance test also ensures that the RCIC System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.2 overlaps this Surveillance to provide complete testing of the assumed safety function.

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. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

This SR is modified by a Note that excludes vessel injection during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.2.1 | ----------NOTES----------<br>1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test.<br><br>2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1.<br>---------- | |
| | Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program. | In accordance with the Primary Containment Leakage Rate Testing Program |
| SR 3.6.1.2.2 | [ Verify primary containment air lock seal air flask pressure is ≥ [90] psig. | [7 days ] |
| SR 3.6.1.2.3 | Verify only one door in the primary containment air lock can be opened at a time. | [24 months |
| SR 3.6.1.2.4 | [ Verify, from an initial pressure of [90] psig, the primary containment air lock seal pneumatic system pressure does not decay at a rate equivalent to > [2] psig for a period of [48] hours. | [[18] months ] |

Insert 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.6.1.2.2

The seal air flask pressure is verified to be at ≥ [90] psig every 7 days to ensure that the seal system remains viable. It must be checked because it could bleed down during or following access through the air lock, which occurs regularly. [The 7 day Frequency has been shown to be acceptable through operating experience and is considered adequate in view of the other indications available to operations personnel that the seal air flask pressure is low.]

SR 3.6.1.2.3

Insert 2

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure (Ref. 3), closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. [Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the primary containment air lock door is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed every 24 months. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of primary containment OPERABILITY if the Surveillance were performed with the reactor at power. The 24 month Frequency for the interlock is justified based on generic operating experience. The 24 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during the use of the airlock.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.6.1.2.4

A seal pneumatic system test to ensure that pressure does not decay at a rate equivalent to > [2] psig for a period of [48] hours from an initial pressure of [90] psig is an effective leakage rate test to verify system performance. ] 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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.] Insert 2

REFERENCES

1. FSAR, Section [3.8].
2. 10 CFR 50, Appendix J, Option [A][B].
3. FSAR, Table [6.2-13].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| G. [ Required Action and associated Completion Time of Condition A, B, C, D, or E not met for PCIV(s) required to be OPERABLE during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment]. | G.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of [recently] irradiated fuel assemblies in [primary and secondary containment]. | Immediately ] |
| H. [ Required Action and Associated Completion Time of Condition A, B, C, D, or E not met for PCIV(s) required to be OPERABLE during MODE 4 or 5 or during operations with a potential for draining the reactor vessel (OPDRVs). | H.1 Initiate action to suspend OPDRVs.<br><br>OR<br><br>H.2 Initiate action to restore valve(s) to OPERABLE status. | Immediately<br><br><br><br>Immediately ] |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.1 | ----------NOTE---------- [ [Only required to be met in MODES 1, 2, and 3.] ---------- Verify each [ ] inch primary containment purge valve is sealed closed except for one purge valve in a penetration flow path while in Condition E of this LCO. | [31 days.] Insert 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.2 | ----------NOTES----------<br>[ 1. [Only required to be met in MODES 1, 2, and 3.]<br><br>2. Not required to be met when the [20] inch primary containment purge valves are open for pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open, provided the drywell [purge supply and exhaust] lines are isolated.<br>----------<br><br>Verify each [20] inch primary containment purge valve is closed. | [31 days ] |
| SR 3.6.1.3.3 | ----------NOTES----------<br>1. Valves and blind flanges in high radiation areas may be verified by use of administrative means.<br><br>2. Not required to be met for PCIVs that are open under administrative controls.<br>----------<br><br>Verify each primary containment isolation manual valve and blind flange that is located outside primary containment, drywell, and steam tunnel and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | [31 days |

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.4 | ----------NOTES----------<br>1. Valves and blind flanges in high radiation areas may be verified by use of administrative means.<br>2. Not required to be met for PCIVs that are open under administrative controls.<br>----------<br><br>Verify each primary containment isolation manual valve and blind flange that is located inside primary containment, drywell, or steam tunnel and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | Prior to entering MODE 2 or 3 from MODE 4, if not performed within the previous 92 days |
| SR 3.6.1.3.5 | Verify the isolation time of each power operated, automatic PCIV[, except MSIVs,] is within limits. | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.6.1.3.6 | ----------NOTE----------<br>[ [Only required to be met in MODES 1, 2, and 3.]<br>----------<br><br>Perform leakage rate testing for each primary containment purge valve with resilient seals. | 184 days<br>INSERT 1<br>AND<br><br>Once within 92 days after opening the valve ] |
| SR 3.6.1.3.7 | Verify the isolation time of each MSIV is ≥ [3] seconds and ≤ [5] seconds. | [In accordance with the Inservice Testing Program or [18] months] |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.8 | Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal. | [18] months |
| SR 3.6.1.3.9 | ----------NOTE----------<br>[ [Only required to be met in MODES 1, 2, and 3.]<br>----------<br>Verify the combined leakage rate for all secondary containment bypass leakage paths is ≤ [ ] $L_a$ when pressurized to ≥ [ ] psig. | In accordance with the Primary Containment Leakage Rate Testing Program ] |
| SR 3.6.1.3.10 | ----------NOTE----------<br>[Only required to be met in MODES 1, 2, and 3.]<br>----------<br>Verify leakage rate through all four main steam lines is ≤ [100] scfh when tested at ≥ [11.5] psig. | [In accordance with the Primary Containment Leakage Rate Testing Program] |
| SR 3.6.1.3.11 | ----------NOTE----------<br>[Only required to be met in MODES 1, 2, and 3.]<br>----------<br>Verify combined leakage rate through hydrostatically tested lines that penetrate the primary containment is within limits. | In accordance with the Primary Containment Leakage Rate Testing Program |
| SR 3.6.1.3.12 | ----------NOTE----------<br>[ [Only required to be met in MODES 1, 2, and 3.]<br>----------<br>Verify each [ ] inch primary containment purge valve is blocked to restrict the valve from opening > [50]%. | [18] months ] |

INSERT 1

BASES

ACTIONS (continued)

product release. Actions must continue until OPDRVs are suspended. If suspending the OPDRVs would result in closing the residual heat removal (RHR) shutdown cooling isolation valves, an alternative Required Action is provided to immediately initiate action to restore the valves to OPERABLE status. This allows RHR to remain in service while actions are being taken to restore the valve. ]

SURVEILLANCE REQUIREMENTS

[ SR 3.6.1.3.1

Each [ ] inch primary containment purge valve is required to be verified sealed closed at 31 day intervals. This SR is intended to apply to primary containment purge valves that are not fully qualified to open under accident conditions. This SR is designed to ensure that a gross breach of primary containment is not caused by an inadvertent or spurious opening of a primary containment purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Primary containment purge valves that are sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. The 31 day Frequency is a result of an NRC initiative, Generic Issue B-24, (Ref. 6) related to primary containment purge valve use during unit operations. INSERT 2

This SR allows a valve that is open under administrative controls to not meet the SR during the time the valve is open. Opening a purge valve under administrative controls is restricted to one valve in a penetration flow path at a given time (refer to discussion for Note 1 of the ACTIONS) in order to effect repairs to that valve. This allows one purge valve to be opened without resulting in a failure of the Surveillance and resultant entry into the ACTIONS for this purge valve, provided the stated restrictions are met. Condition E must be entered during this allowance, and the valve opened only as necessary for effecting repairs. Each purge valve in the penetration flow path may be alternately opened, provided one remains sealed closed, if necessary, to complete repairs on the penetration.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ The SR is modified by a Note stating that primary containment purge valves are only required to be sealed closed in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, the purge valves may not be capable of closing before the pressure pulse affects systems downstream of the purge valves or the release of radioactive material will exceed limits prior to the closing of the purge valves. At other times when the purge valves are required to be capable of closing (e.g., during movement of [recently] irradiated fuel assemblies), pressurization concerns are not present and the purge valves are allowed to be open. ] ]

[ SR 3.6.1.3.2

This SR verifies that the [20] inch primary containment purge valves are closed as required or, if open, open for an allowable reason. If a purge valve is open in violation of this SR, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits.

The SR is also modified by a Note (Note 1) stating that primary containment purge valves are only required to be closed in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, the purge valves may not be capable of closing before the pressure pulse affects systems downstream of the purge valves, or the release of radioactive material will exceed limits prior to the purge valves closing. At other times when the purge valves are required to be capable of closing (e.g., during movement of irradiated fuel assemblies) pressurization concerns are not present and the purge valves are allowed to be open.

The SR is modified by a Note (Note 2) stating that the SR is not required to be met when the purge valves are open for the stated reasons. The Note states that these valves may be opened for pressure control, ALARA, or air quality considerations for personnel entry, or for Surveillances that require the valves to be open, provided the drywell [purge supply and exhaust] lines are isolated. These primary containment purge valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. [The 31 day Frequency is consistent with other primary containment purge valve requirements discussed in SR 3.6.1.3.1. ]

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.3

This SR verifies that each primary containment isolation manual valve and blind flange that is located outside primary containment, drywell, and steam tunnel, and not locked, sealed, or otherwise secured and is required to be closed during accident conditions, is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the primary containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification that those PCIVs outside primary containment, and capable of being mispositioned, are in the correct position. Since verification of valve position for PCIVs outside primary containment is relatively easy, the 31 day Frequency was chosen to provide added assurance that the PCIVs are in the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing. Insert 2

Two Notes are added to this SR. The first Note applies to valves and blind flanges located in high radiation areas and allows them to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these PCIVs, once they have been verified to be in the proper position, is low. A second Note is included to clarify that PCIVs open under administrative controls are not required to meet the SR during the time the PCIVs are open.

SR 3.6.1.3.4

This SR verifies that each primary containment manual isolation valve and blind flange located inside primary containment, drywell, or steam tunnel, 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 the primary containment boundary is within design limits. For PCIVs inside primary containment, drywell, or steam tunnel the Frequency of "prior to entering MODE 2 or 3 from MODE 4, if not performed within the previous 92 days," is appropriate since these PCIVs are operated under administrative controls and the probability of their misalignment is low. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Two Notes are added to this SR. The first Note allows valves and blind flanges located in high radiation areas to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable since access to these areas is typically restricted during MODES 1, 2, and 3. Therefore, the probability of misalignment of these PCIVs, once they have been verified to be in their proper position, is low. A second Note is included to clarify that PCIVs that are open under administrative controls are not required to meet the SR during the time that the PCIVs are open.

SR 3.6.1.3.5

Verifying the isolation time of each power operated, automatic PCIV is within limits is required to demonstrate OPERABILITY. MSIVs may be excluded from this SR since MSIV full closure isolation time is demonstrated by SR 3.6.1.3.6. The isolation time test ensures that the valve will isolate in a time period less than or equal to that assumed in the safety analysis. [The isolation ~~time and~~ Frequency of this SR ~~are~~ is [in accordance with the Inservice Testing Program or 92 days].

Insert 2

The isolation time is in accordance with the Inservice Testing Program.

[SR 3.6.1.3.6

For primary containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option [A][B] (Ref. 4), is required to ensure OPERABILITY. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. [Based on this observation, and the importance of maintaining this penetration leak tight (due to the direct path between primary containment and the environment), a Frequency of 184 days was established. Additionally, this SR must be performed within 92 days after opening the valve. The 92 day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that which occurs to a valve that has not been opened). Thus, decreasing the interval (from ~~184~~ days) is a prudent measure after a valve has been opened.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

The SR is modified by a Note stating that the primary containment purge valves are only required to meet leakage rate testing requirements in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, purge valve leakage must be minimized to ensure offsite radiological release is within limits. At other times when the purge valves are required to be capable of closing (e.g., during handling of [recently] irradiated fuel), pressurization concerns are not present and the purge valves are not required to meet any specific leakage criteria. ]

SR 3.6.1.3.7

Verifying that the full closure isolation time of each MSIV is within the specified limits is required to demonstrate OPERABILITY. The full closure isolation time test ensures that the MSIV will isolate in a time period that does not exceed the times assumed in the DBA analyses. [The Frequency of this SR is [in accordance with the Inservice Testing Program or 18 months]. Insert 2

SR 3.6.1.3.8

Automatic PCIVs close on a primary containment isolation signal to prevent leakage of radioactive material from primary containment following a DBA. This SR ensures that each automatic PCIV will actuate to its isolation position on a primary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.1.6 overlaps this SR to provide complete testing of the safety function. [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. 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. INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.11

Surveillance of hydrostatically tested lines provides assurance that the calculation assumptions of References 1 and 2 are met. The acceptance criteria for the combined leakage of all hydrostatically tested lines is [1.0 gpm times the total number of hydrostatically tested PCIVs] when tested at 1.1 $P_a$ ([63.25] psig). The combined leakage rates must be demonstrated to be in accordance with the leakage test frequency required by the Primary Containment Leakage Rate Testing Program.

[ This SR is modified by a Note that states that these valves are only required to meet the combined leakage rate in MODES 1, 2, and 3 since this is when the Reactor Coolant System is pressurized and primary containment is required. In some instances, the valves are required to be capable of automatically closing during MODES other than MODES 1, 2, and 3. However, specific leakage limits are not applicable in these other MODES or conditions. ]

[ SR 3.6.1.3.12

----------REVIEWER'S NOTE----------
This SR is only required for those plants with purge valves with resilient seals allowed to be open during [MODE 1, 2, or 3] and having blocking devices on the valves that are not permanently installed.
---

Verifying that each [ ] inch primary containment purge valve is blocked to restrict opening to ≤ [50%] is required to ensure that the valves can close under DBA conditions within the time limits assumed in the analyses of References 1 and 2.

[ The SR is modified by a Note stating that this SR is only required to be met in MODES 1, 2, and 3. If a LOCA inside primary containment occurs in these MODES, the purge valves must close to maintain containment leakage within the values assumed in the accident analysis. At other times when purge valves are required to be capable of closing (e.g., during movement of [recently] irradiated fuel assemblies), pressurization concerns are not present, thus the purge valves can be fully open. [ The [18] month Frequency is appropriate because the blocking devices are typically removed only during a refueling outage. ] ]

INSERT 2

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.4 Primary Containment Pressure

LCO 3.6.1.4 Primary containment [to secondary containment differential] pressure shall be [≥ -0.1 psid and ≤ 1.0 psid].

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Primary containment [to secondary containment differential] pressure not within limits. | A.1 Restore primary containment [to secondary containment differential] pressure to within limits. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.4.1 | Verify primary containment [to secondary containment differential] pressure is within limits. | [12 hours |

Insert 1

BASES

LCO

A limitation on the primary [to secondary containment differential] pressure of [≥ -0.1 and ≤ 1.0 psid] is required to ensure that primary containment initial conditions are consistent with the initial safety analyses assumptions so that containment pressures remain within design values during a LOCA and the design value of containment negative pressure is not exceeded during an inadvertent operation of containment sprays.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could result in a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining primary containment pressure within limits is not required in MODE 4 or 5.

ACTIONS

A.1

When primary [to secondary containment differential] pressure is not within the limits of the LCO, differential pressure must be restored to within limits within 1 hour. The Required Action is necessary to return operation to within the bounds of the primary containment analysis. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, "Primary Containment," which requires that primary containment be restored to OPERABLE status within 1 hour.

B.1 and B.2

If primary [to secondary containment differential] pressure cannot be restored to within limits within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.4.1

Verifying that primary containment [to secondary containment differential] pressure is within limits ensures that operation remains within the limits assumed in the primary containment analysis. The 12 hour Frequency of this SR was developed based on operating experience related to trending primary 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 primary containment pressure condition.

INSERT 2

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.5 Primary Containment Air Temperature

LCO 3.6.1.5 Primary containment average air temperature shall be ≤ [95]°F.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Primary containment average air temperature not within limit. | A.1 Restore primary containment average air temperature to within limit. | 8 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.5.1 | Verify primary containment average air temperature is within limit. | [24 hours INSERT 1 |

BASES

ACTIONS

A.1

When primary containment average air temperature is not within the limit of the LCO, it must be restored within 8 hours. This Required Action is necessary to return operation to within the bounds of the primary containment analysis. The 8 hour Completion Time is acceptable, considering the sensitivity of the analysis to variations in this parameter, and provides sufficient time to correct minor problems.

B.1 and B.2

If the primary containment average air temperature cannot be restored to within limit within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.5.1

Verifying that the primary containment average air temperature is within the LCO limit ensures that operation remains within the limits assumed for the primary containment analyses. In order to determine the primary containment average air temperature, an arithmetic average is calculated, using measurements taken at locations within the primary containment selected to provide a representative sample of the overall primary containment atmosphere.

The 24 hour Frequency of this SR is considered acceptable based on observed slow rates of temperature increase within primary containment as a result of environmental heat sources (due to large volume of the primary 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 primary containment air temperature condition. INSERT 2

REFERENCES

1. FSAR, Section [6.2].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.6 Low-Low Set (LLS) Valves

LCO 3.6.1.6 The LLS function of [six] safety/relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One LLS valve inoperable. | A.1 Restore LLS valve to OPERABLE status. | 14 days |
| B. Required Action and associated Completion Time of Condition A not met.<br><br>OR<br><br>Two or more LLS valves inoperable. | B.1 Be in MODE 3.<br><br>AND<br><br>B.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.6.1 | ----------NOTE----------<br>Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test.<br>----------<br><br>Verify each LLS valve opens when manually actuated. | [18] months [on a STAGGERED TEST BASIS for each valve solenoid] INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.6.2 | ----------NOTE----------<br>Valve actuation may be excluded.<br>----------<br><br>Verify the LLS System actuates on an actual or simulated automatic initiation signal. | [18 months INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS (continued)

Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow ≥ $10^6$ lb/hr]. [The [18] month Frequency was developed based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 3). The Frequency of [18] months on a STAGGERED TEST BASIS ensures that each solenoid for each S/RV is alternately tested. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

Since steam pressure is required in order to perform the Surveillance, however, and steam may not be available during a unit outage, the Surveillance may be performed during the shutdown prior to or the startup following a unit outage. Unit startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified by Reference 3 prior to valve installation. After adequate reactor steam dome pressure and flow are reached, 12 hours are allowed to prepare for and perform the test.

SR 3.6.1.6.2

The LLS designed S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the automatic LLS function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.5.4 overlaps this SR to provide complete testing of the safety function.

[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. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

This SR is modified by a Note that excludes valve actuation. This prevents a reactor pressure vessel pressure blowdown.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.7.1 | ----------NOTE----------<br>RHR containment spray subsystems may be considered OPERABLE during alignment and operation for decay heat removal when below [the RHR cut in permissive pressure in MODE 3] if capable of being manually realigned and not otherwise inoperable.<br>----------<br><br>Verify each RHR containment spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position. | [31 days |
| SR 3.6.1.7.2 | Verify each RHR pump develops a flow rate of ≥ [5650] gpm on recirculation flow through the associated heat exchanger to the suppression pool. | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.6.1.7.3 | Verify each RHR containment spray subsystem automatic valve in the flow path actuates to its correct position on an actual or simulated automatic initiation signal. | [18] months |
| SR 3.6.1.7.4 | Verify each spray nozzle is unobstructed. | [At first refueling]<br><br>AND<br><br>[10 years |

INSERT 1

BASES

ACTIONS (continued)

C.1 and C.2

If the inoperable RHR containment spray subsystem cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.7.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR containment spray mode flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these 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 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 of this SR is justified because the valves are operated under procedural control and because improper valve position would affect only a single subsystem. This Frequency has been shown to be acceptable based on operating experience. INSERT 2

A Note has been added to this SR that allows RHR containment spray subsystems to be considered OPERABLE during alignment to and operation in the RHR shutdown cooling mode when below [the RHR cut in permissive pressure in MODE 3], if capable of being manually realigned and not otherwise inoperable. At these low pressures and decay heat levels (the reactor is shut down in MODE 3), a reduced complement of subsystems can provide the required containment pressure mitigation function thereby allowing operation of an RHR shutdown cooling loop when necessary.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.7.2

Verifying each RHR pump develops a flow rate ≥ [5650] gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded during the cycle. It is tested in the pool cooling mode to demonstrate pump OPERABILITY without spraying down equipment in primary containment. Flow is a normal test of centrifugal pump performance required by the ASME Code, Section XI (Ref. 2). This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. [The Frequency of this SR is in accordance with the Inservice Testing Program or 92 days.]

SR 3.6.1.7.3

This SR verifies that each RHR containment spray subsystem automatic valve actuates to its correct position upon receipt of an actual or simulated automatic actuation signal. Actual spray initiation is not required to meet this SR. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.6 overlaps this SR to provide complete testing of the safety function. [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. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.]

INSERT 2

SR 3.6.1.7.4

This Surveillance is performed every ~~10~~ years to verify that the spray nozzles are not obstructed and that flow will be provided when required. [The 10 year Frequency is adequate to detect degradation in performance due to the passive nozzle design and its normally dry state and has been shown to be acceptable through operating experience.]

REFERENCES

1. FSAR, Section [6.2.1.1.5].
2. ASME, Boiler and Pressure Vessel Code, Section XI.

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.8 Penetration Valve Leakage Control System (PVLCS)

LCO 3.6.1.8 [Two] PVLCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One PVLCS subsystem inoperable. | A.1 | Restore PVLCS subsystems to OPERABLE status. | 30 days |
| B. [Two] PVLCS subsystems inoperable. | B.1 | Restore one PVLCS subsystem to OPERABLE status. | 7 days |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.8.1 | Verify air pressure in each subsystem is ≥ [101] psig. | [24 hours |
| SR 3.6.1.8.2 | Perform a system functional test of each PVLCS subsystem. | [[18] months |

Insert 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.8.1

The minimum air supply necessary for PVLCS OPERABILITY varies with the system being supplied with compressed air from the PVLCS accumulators. Due to the support system function of PVLCS for S/RV actuator air, however, the specified minimum pressure of [101] psig is required, which provides sufficient air for [ ] S/RV actuations with the drywell pressure at 30 psig. This minimum air pressure alone is sufficient for PVLCS to support the OPERABILITY of these S/RV systems and is verified every 24 hours. The 24 hour Frequency is considered adequate in view of other indications available in the control room, such as alarms, to alert the operator to an abnormal PVLCS air pressure condition.

INSERT 2

SR 3.6.1.8.2

A simulated system operation is performed every [18] months to ensure that the PVLCS will function throughout its operating sequence. This includes correct automatic positioning of valves once the system is initiated manually. Proper functioning of the compressor and valves is verified by this Surveillance. The [18] month Frequency was developed considering it is prudent that many Surveillances be performed only during a plant outage. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [15.6.5].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.9 Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)

LCO 3.6.1.9 Two MSIV LCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One MSIV LCS subsystem inoperable. | A.1 Restore MSIV LCS subsystem to OPERABLE status. | 30 days |
| B. Two MSIV LCS subsystems inoperable. | B.1 Restore one MSIV LCS subsystem to OPERABLE status. | 7 days |
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3.<br>AND<br>C.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.9.1 | Operate each MSIV LCS blower ≥ [15] minutes. | [31 days |
| SR 3.6.1.9.2 | Verify electrical continuity of each inboard MSIV LCS subsystem heater element circuitry. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.9.3 | Perform a system functional test of each MSIV LCS subsystem. | [[18] months INSERT 1 |

BASES

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment. Therefore, MSIV LCS OPERABILITY is required during these MODES. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the MSIV LCS OPERABLE is not required in MODE 4 or 5 to ensure MSIV leakage is processed.

ACTIONS

A.1

With one MSIV LCS subsystem inoperable, the inoperable MSIV LCS subsystem must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MSIV LCS subsystem is adequate to perform the required leakage control function. However, the overall reliability is reduced because a single failure in the remaining subsystem could result in a total loss of MSIV leakage control function. The 30 day Completion Time is based on the redundant capability afforded by the remaining OPERABLE MSIV LCS subsystem and the low probability of a DBA LOCA occurring during this period.

B.1

With two MSIV LCS subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of the occurrence of a DBA LOCA.

C.1 and C.2

If the MSIV LCS subsystem cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.9.1

Each MSIV LCS blower is operated for ≥ [15] minutes to verify OPERABILITY. The 31 day Frequency was developed considering the known reliability of the LCS blower and controls, the two subsystem redundancy, and the low probability of a significant degradation of the MSIV LCS subsystem occurring between surveillances and has been shown to be acceptable through operating experience. Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.9.2

The electrical continuity of each inboard MSIV LCS subsystem heater is verified by a resistance check, by verifying the rate of temperature increase meets specifications, or by verifying the current or wattage draw meets specifications. The 31 day Frequency is based on operating experience that has shown that these components usually pass this Surveillance when performed at this Frequency.

INSERT 2

SR 3.6.1.9.3

A system functional test is performed to ensure that the MSIV LCS will operate through its operating sequence. This includes verifying that the automatic positioning of the valves and the operation of each interlock and timer are correct, that the blowers start and develop the required flow rate and the necessary vacuum, and the upstream heaters meet current or wattage draw requirements (if not used to verify electrical continuity in SR 3.6.1.9.2). 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. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [6.7].
2. Regulatory Guide 1.96, Revision [1].
3. FSAR, Section [15.6.5].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Suppression pool average temperature > [120]°F. | E.1 Depressurize the reactor vessel to < [200] psig.<br><br>AND<br><br>E.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.1.1 | Verify suppression pool average temperature is within the applicable limits. | [24 hours ← INSERT 1<br><br>AND<br><br>5 minutes when performing testing that adds heat to the suppression pool |

BASES

ACTIONS (continued)

Continued addition of heat to the suppression pool with pool temperature > [120]°F could result in exceeding the design basis maximum allowable values for primary containment temperature or pressure. Furthermore, if a blowdown were to occur when temperature was > [120]°F, the maximum allowable bulk and local temperatures could be exceeded very quickly.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1.1

The suppression pool average temperature is regularly monitored to ensure that the required limits are satisfied. Average temperature is determined by taking an arithmetic average of the OPERABLE suppression pool water temperature channels. The 24 hour Frequency has been shown to be acceptable based on operating experience. When heat is being added to the suppression pool by testing, however, it is necessary to monitor suppression pool temperature more frequently. The 5 minute Frequency during testing is justified by the rates at which testing will heat up the suppression pool, has been shown to be acceptable based on operating experience, and provides assurance that allowable pool temperatures are not exceeded. The Frequencies are further justified in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool average temperature condition.

INSERT 2

y is

REFERENCES

1. FSAR, Section [6.2].

2. FSAR, Section [15.2].

3. NUREG-0783.

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be ≥ [18 ft 4.5 inches] and ≤ [18 ft 9.75 inches]

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Suppression pool water level not within limits. | A.1 Restore suppression pool water level to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.2.1 | Verify suppression pool water level is within limits. | 24 hours INSERT 1 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2.1

Verification of the suppression pool water level is to ensure that the required limits are satisfied. The 24 hour Frequency of this SR was developed considering operating experience related to trending variations in suppression pool water level and water level instrument drift during the applicable MODES and to assessing the proximity to the specified LCO level limits. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool water level condition. INSERT 2

REFERENCES

1. FSAR, Section [6.2].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling

LCO 3.6.2.3 Two RHR suppression pool cooling subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One RHR suppression pool cooling subsystem inoperable. | A.1 Restore RHR suppression pool cooling subsystem to OPERABLE status. | 7 days |
| B. Two RHR supression pool cooling subsystems inoperable. | B.1 Restore one RHR suppression pool cooling subsystem to OPERABLE status. | 8 hours |
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3.<br>AND<br>C.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.3.1 | Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position. | 31 days ← INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.3.2 | Verify each RHR pump develops a flow rate ≥ [7450] gpm through the associated heat exchanger while operating in the suppression pool cooling mode. | [In accordance with the Inservice Testing Program or 92 days] Insert 1 |

BASES

ACTIONS (continued)

C.1 and C.2

If the Required Action and required Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual, power operated, and automatic valves, in the RHR suppression pool cooling mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to being locked, sealed, or secured. A valve is also allowed to be in the nonaccident position, provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable, since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable, based on operating experience.

INSERT 2

SR 3.6.2.3.2

Verifying each RHR pump develops a flow rate ≥ [7450] gpm, while operating in the suppression pool cooling mode with flow through the associated heat exchanger ~~at least every 92 days~~ ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME Section XI (Ref. 2). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is [in accordance with the Inservice Testing Program or 92 days].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.4 Suppression Pool Makeup (SPMU) System

LCO 3.6.2.4 Two SPMU subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Upper containment pool water level not within limit. | A.1 | Restore upper containment pool water level to within limit. | 4 hours |
| B. Upper containment pool water temperature not within limit. | B.1 | Restore upper containment pool water temperature to within limit. | 24 hours |
| C. One SPMU subsystem inoperable for reasons other than Condition A or B. | C.1 | Restore SPMU subsystem to OPERABLE status. | 7 days |
| D. Required Action and associated Completion Time not met. | D.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | D.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.4.1 | Verify upper containment pool water level is ≥ [23 ft 3 inches] above the pool bottom. | [24 hours ← INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.4.2 | Verify upper containment pool water temperature is ≤ [125]°F. | [24 hours |
| SR 3.6.2.4.3 | Verify each SPMU subsystem manual, power operated, and automatic valve that is not locked, sealed, or otherwise secured in position is in the correct position. | [31 days |
| SR 3.6.2.4.4 | [ Verify all upper containment pool gates are in the stored position or are otherwise removed from the upper containment pool. | [31 days ] |
| SR 3.6.2.4.5 | ----------NOTE---------- Actual makeup to the suppression pool may be excluded. ---------- Verify each SPMU subsystem automatic valve actuates to the correct position on an actual or simulated automatic initiation signal. | [[18] months |

INSERT 1

BASES

ACTIONS (continued)

C.1

With one SPMU subsystem inoperable for reasons other than Condition A or B, the inoperable subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is acceptable in light of the redundant SPMU System capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

D.1 and D.2

If any Required Action and required Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1

The upper containment pool water level is regularly monitored to ensure that the required limits are satisfied. The 24 hour Frequency of this SR was developed, considering operating experience related to upper containment pool water level variations and water level instrument drift during the applicable MODES and considering the low probability of a DBA occurring between surveillances. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal upper containment pool water level condition.

INSERT 2

SR 3.6.2.4.2

The upper containment pool water temperature is regularly monitored to ensure that the required limit is satisfied. The 24 hour Frequency was developed, based on operating experience related to upper containment pool temperature variations during the applicable MODES.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.2.4.3

Verifying the correct alignment for manual, power operated, and automatic valves in the SPMU System flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves 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 potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Frequency of 31 days is justified because the valves are operated under procedural control and because improper valve position would affect only a single subsystem. This Frequency has been shown to be acceptable through operating experience.

INSERT 2

[ SR 3.6.2.4.4

The upper containment pool has two gates used to separate the pool into distinct sections to facilitate fuel transfer and maintenance during refueling operations and two additional gates in the separator pool weir wall extension, which, when installed, limit personnel exposure and ensure adequate water submergence of the separator when the separator is stored in the pool. The SPMU System dump line penetrations are located in the steam separator storage section of the pool. To provide the required SPMU System dump volume to the suppression pool, the gates must be removed (or placed in their stored position) to allow communication between the various pool sections. The 31 day Frequency is appropriate because the gates are moved under procedural control and only the infrequent movement of these gates is required in MODES 1, 2, and 3. ]

SR 3.6.2.4.5

This SR requires a verification that each SPMU subsystem automatic valve actuates to its correct position on receipt of an actual or simulated automatic initiation signal. This includes verification of the correct automatic positioning of the valves and of the operation of each interlock and timer. As noted, actual makeup to the suppression pool may be

BASES

SURVEILLANCE REQUIREMENTS (continued)

excluded. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.4.6 overlaps this SR to provide complete testing of the safety function. 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. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. FSAR, Section [6.2].
2. FSAR, Chapter [15].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.1.1 | Energize each primary containment and drywell hydrogen ignitor division and perform current versus voltage measurements to verify required ignitors in service. | [184 days |
| SR 3.6.3.1.2 | ----------NOTE---------- Not required to be performed until 92 days after discovery of four or more ignitors in the division inoperable. ---------- Energize each primary containment and drywell hydrogen ignitor division and perform current versus voltage measurements to verify required ignitors in service. | [92 days |
| SR 3.6.3.1.3 | Verify each required ignitor in inaccessible areas develops sufficient current draw for a ≥ [1700]°F surface temperature. | [[18] months |
| SR 3.6.3.1.4 | Verify each required ignitor in accessible areas develops a surface temperature of ≥ [1700]°F. | [[18] months |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1.1 and SR 3.6.3.1.2

These SRs verify that there are no physical problems that could affect the ignitor operation. Since the ignitors are mechanically passive, they are not subject to mechanical failure. The only credible failures are loss of power or burnout. The verification that each required ignitor is energized is performed by circuit current versus voltage measurement.

The Frequency of 184 days has been shown to be acceptable through operating experience because of the low failure occurrence, and provides assurance that hydrogen burn capability exists between the more rigorous 18 month Surveillances. Operating experience has shown these components usually pass the Surveillance when performed at a 184 day Frequency. Additionally, these surveillances must be performed every 92 days if four or more ignitors in any division are inoperable. The 92 day Frequency was chosen, recognizing that the failure occurrence is higher than normal. Thus, decreasing the Frequency from 184 days to 92 days is a prudent measure, since only two more inoperable ignitors (for a total of six) will result in an inoperable ignitor division. SR 3.6.3.1.2 is modified by a Note that indicates that the Surveillance is not required to be performed until 92 days after four or more ignitors in the division are discovered to be inoperable.

INSERT 2

[ SR 3.6.3.1.3 and SR 3.6.3.1.4

These functional tests are performed every 18 months to verify system OPERABILITY. The current draw to develop a surface temperature of ≥ 1700°F is verified for ignitors in inaccessible areas, e.g., in a high radiation area. Additionally, the surface temperature of each accessible ignitor is measured to be ≥ 1700°F to demonstrate that a temperature sufficient for ignition is achieved. 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. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. ]

REFERENCES

1. 10 CFR 50.44.

2. 10 CFR 50, Appendix A, GDC 41.

3. FSAR, Section [6.2.5].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.2.1 | Operate each [drywell purge] subsystem for ≥ [15] minutes. | [92 days |
| SR 3.6.3.2.2 | [ Verify each [drywell purge] subsystem flow rate is ≥ [500] scfm. | [18] months ] |

INSERT 1

BASES

ACTIONS (continued)

[Both] the [initial] verification may [and all subsequent verifications] may be performed as an administrative check by examining logs or other information to determine the availability of the alternate hydrogen control system. It does not mean to perform the surveillances needed to demonstrate OPERABILITY of the alternate hydrogen control system. If the ability to perform the hydrogen control function is maintained, continued operation is permitted with two [drywell purge] subsystems inoperable for up to 7 days. Seven days is a reasonable time to allow two [drywell purge] subsystems to be inoperable because the hydrogen control function is maintained and because of the low probability of the occurrence of a LOCA that would generate hydrogen in amounts capable of exceeding the flammability limit.

C.1

If any Required Action and the required Completion Time cannot be met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2.1

Operating each [drywell purge] subsystem for ≥ 15 minutes ensures that each subsystem is OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, compressor failure, or excessive vibration can be detected for corrective action. The 92 day Frequency is consistent with Inservice Testing Program Frequencies, operating experience, the known reliability of the compressor and controls, and the two redundant subsystems available.

INSERT 2

[ SR 3.6.3.2.2

Verifying that each [drywell purge] subsystem flow rate is ≥ [500] scfm ensures that each subsystem is capable of maintaining drywell hydrogen concentrations below the flammability limit. 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. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.]

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.1.1 | [ Verify [secondary containment] vacuum is ≥ [0.25] inch of vacuum water gauge. | [24 hours ] |
| SR 3.6.4.1.2 | Verify all [secondary containment] equipment hatches are closed and sealed. | [31 days |
| SR 3.6.4.1.3 | Verify one [secondary containment] access door in each access opening is closed, except when the access opening is being used for entry and exit. | [31 days |
| SR 3.6.4.1.4 | [ Verify the [secondary containment] can be drawn down to ≥ [0.25] inch of vacuum water gauge in ≤ [120] seconds using one standby gas treatment (SGT) subsystem. | [18] months on a STAGGERED TEST BASIS for each SGT subsystem ] |
| SR 3.6.4.1.5 | Verify the [secondary containment] can be maintained ≥ [0.266] inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate ≤ [4000] cfm. | [18] months on a STAGGERED TEST BASIS for each SGT subsystem |

INSERT 1

BASES

ACTIONS (continued)

[ C.1 and C.2

Movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] and OPDRVs can be postulated to cause significant fission product release to the [secondary containment]. In such cases, the [secondary containment] is the only barrier to release of fission products to the environment. Therefore, movement of [recently] irradiated fuel assemblies must be immediately suspended if the [secondary containment] is inoperable.

Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. Also, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

Required Action C.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving [recently] irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of [recently] irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown. ]

SURVEILLANCE REQUIREMENTS

[ SR 3.6.4.1.1

This SR ensures that the [secondary containment] boundary is sufficiently leak tight to preclude exfiltration under expected wind conditions. [The 24 hour Frequency of this SR was developed based on operating experience related to [secondary containment] vacuum variations during the applicable MODES and the low probability of a DBA occurring between surveillances.

Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal [secondary containment] vacuum condition. ]

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.1.2 and SR 3.6.4.1.3

Verifying that [secondary containment] equipment hatches and one access door in each access opening are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the [secondary containment] will not occur. In this application, the term "sealed" has no connotation of leak tightness. Maintaining [secondary containment] OPERABILITY requires verifying one door in the access opening is closed. [An access opening contains one inner and one outer door. In some cases, [secondary] containment access openings are shared such that a [secondary] containment barrier may have multiple inner or multiple outer doors. The intent is to not breach the [secondary] containment at any time when [secondary] containment is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times.] However, all [secondary] containment access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. The 31 day Frequency for these SRs has been shown to be adequate based on operating experience, and is considered adequate in view of the other indications of door and hatch status that are available to the operator.

INSERT 2

[SR 3.6.4.1.4 and] SR 3.6.4.1.5

The SGT System exhausts the [secondary] containment atmosphere to the environment through appropriate treatment equipment. Each SGT subsystem is designed to draw down pressure in the [secondary] containment to ≥[0.25] inches of vacuum water gauge in ≤ [120] seconds and maintain pressure in the [secondary] containment at ≥ [0.266] inches of vacuum water gauge for 1 hour at a flow rate ≤ [4000] cfm. To ensure that all fission products released to the [secondary] containment are treated, [SR 3.6.4.1.4 and] SR 3.6.4.1.5 verify that a pressure in the [secondary] containment that is less than the lowest postulated pressure external to the [secondary] containment boundary can [rapidly] be [established and] maintained. When the SGT System is operating as designed, the establishment and maintenance of [secondary] containment pressure cannot be accomplished if the [secondary] containment

BASES

SURVEILLANCE REQUIREMENTS (continued)

boundary is not intact. [Establishment of this pressure is confirmed by SR 3.6.4.1.4, which demonstrates that the [secondary] containment can be drawn down to ≥ [0.25] inches of vacuum water gauge in ≤ [120] seconds using one SGT subsystem.] SR 3.6.4.1.5 demonstrates that the pressure in the [secondary] containment can be maintained ≥ [0.266] inches of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate ≤ [4000] cfm. The 1 hour test period allows [secondary] containment to be in thermal equilibrium at steady state conditions. The primary purpose of these SR[s] is to ensure [secondary] containment boundary integrity. The secondary purpose of these SR[s] is to ensure that the SGT subsystem being tested functions as designed. There is a separate LCO with Surveillance Requirements which serves the primary purpose of ensuring OPERABILITY of the SGT System. These SR[s] need not be performed with each SGT subsystem. The SGT subsystem used for these Surveillance[s] is staggered to ensure that in addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. The inoperability of the SGT System does not necessarily constitute a failure of these Surveillance[s] relative to the [secondary] containment OPERABILITY. Operating experience has shown the [secondary] containment boundary usually passes these Surveillance[s] when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. FSAR, Section [15.6.5].
2. FSAR, Section [15.7.6].
3. FSAR, Section [15.7.4].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Required Action and associated Completion Time of Condition A or B not met during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs. | D.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment]. | Immediately |
| | AND | |
| | D.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.2.1 | ----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative controls. 2. Not required to be met for SCIVs that are open under administrative means. ---------- Verify each secondary containment isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | [31 days |
| SR 3.6.4.2.2 | Verify the isolation time of each power operated, automatic SCIV is within limits. | [In accordance with the Inservice Testing Program or 92 days] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.2.3 | Verify each automatic SCIV actuates to the isolation position on an actual or simulated automatic isolation signal. | [18] months INSERT 1 |

BASES

ACTIONS (continued)

D.1 and D.2

If any Required Action and associated Completion Time cannot be met, the plant must be placed in a condition in which the LCO does not apply. If applicable, the movement of [recently] irradiated fuel assemblies in the [primary and secondary containment] must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, action must be immediately initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving [recently] irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of [recently] irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

This SR verifies each secondary containment isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the [secondary containment] boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification that those SCIVs in [secondary containment] that are capable of being mispositioned are in the correct position.

Insert 2

Since these SCIVs are readily accessible to personnel during normal unit operation and verification of their position is relatively easy, the 31 day Frequency was chosen to provide added assurance that the SCIVs are in the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Two Notes have been added to this SR. The first Note applies to valves and blind flanges located in high radiation areas and allows them to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these SCIVs, once they have been verified to be in the proper position, is low.

A second Note has been included to clarify that SCIVs that are open under administrative controls are not required to meet the SR during the time the SCIVs are open.

SR 3.6.4.2.2

The isolation time is in accordance with the Inservice Testing Program.

Verifying the isolation time of each power operated, automatic SCIV is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCIV will isolate in a time period less than or equal to that assumed in the safety analyses. The ~~isolation time and~~ Frequency of this SR ~~are~~ is [in accordance with the Inservice Testing Program or 92 days].

SR 3.6.4.2.3

Verifying that each automatic SCIV closes on a [secondary containment] isolation signal is required to prevent leakage of radioactive material from [secondary containment] following a DBA or other accidents. This SR ensures that each automatic SCIV will actuate to the isolation position on a [secondary containment] isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. 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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2.2 Initiate action to suspend OPDRVs. | Immediately |
| D. Two SGT subsystems inoperable in MODE 1, 2, or 3. | D.1 Enter LCO 3.0.3. | Immediately |
| E. Two SGT subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs. | E.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment]. | Immediately |
| | AND | |
| | E.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.3.1 | Operate each SGT subsystem for ≥ [10] continuous hours [with heaters operating]. | [31 days |
| SR 3.6.4.3.2 | Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP). | In accordance with the VFTP |
| SR 3.6.4.3.3 | Verify each SGT subsystem actuates on an actual or simulated initiation signal. | [18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.3.4 | [ Verify each SGT filter cooler bypass damper can be opened and the fan started. | [[18] months ] INSERT 1 |

BASES

ACTIONS (continued)

Required Action E.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving [recently] irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of [recently] irradiated fuel assemblies would not be sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem for ≥ [10] continuous hours ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation [with the heaters on (automatic heater cycling to maintain temperature)] for ≥ [10] continuous hours every 31 days eliminates moisture on the adsorbers and HEPA filters. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specified test frequencies and additional information are discussed in detail in the VFTP.

INSERT 2

SR 3.6.4.3.3

This SR requires verification that each SGT subsystem starts upon receipt of an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.6.4.3.4

This SR requires verification that the SGT filter cooler bypass damper can be opened and the fan started. This ensures that the ventilation mode of SGT System operation is available. [While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.] INSERT 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. FSAR, Section [6.2.3].
3. FSAR, Section [15.6.5].

## 3.6 CONTAINMENT SYSTEMS

### 3.6.5.1 Drywell

LCO 3.6.5.1 The drywell shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Drywell inoperable. | A.1 Restore drywell to OPERABLE status. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.1.1 | Verify bypass leakage is less than or equal to the bypass leakage limit. However, during the first unit startup following bypass leakage testing performed in accordance with this SR, the acceptance criterion is ≤ [10%] of the drywell bypass leakage limit. | [18] months |
| SR 3.6.5.1.2 | Visually inspect the exposed accessible interior and exterior surfaces of the drywell. | [40] months |

Insert 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1.1

The analyses in Reference 2 are based on a maximum drywell bypass leakage. This Surveillance ensures that the actual drywell bypass leakage is less than or equal to the acceptable A/√k design value of [1.0] $ft^2$ assumed in the safety analysis. As left drywell bypass leakage, prior to the first startup after performing a required drywell bypass leakage test, is required to be ≤ [10%] of the drywell bypass leakage limit. At all other times between required drywell leakage rate tests, the acceptance criteria is based on design A/√k. At the design A/√k the containment temperature and pressurization response are bounded by the assumptions of the safety analysis. [The leakage test is performed every [18] months, consistent with the difficulty of performing the test, risk of high radiation exposure, and the remote possibility that a component failure that is not identified by some other drywell or primary containment SR might occur. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

SR 3.6.5.1.2

The exposed accessible drywell interior and exterior surfaces are inspected to ensure there are no apparent physical defects that would prevent the drywell from performing its intended function. This SR ensures that drywell structural integrity is maintained. [The [40] month Frequency was chosen so that the interior and exterior surfaces of the drywell can be inspected at every other refueling outage. Due to the passive nature of the drywell structure, the [40] month Frequency is sufficient to identify component degradation that may affect drywell structural integrity.

REFERENCES

1. FSAR, Chapter [6] and Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Required Action and associated Completion Time not met. | D.1 Be in MODE 3. | 12 hours |
| | AND | |
| | D.2 Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.2.1 | ----------NOTE----------<br>Only required to be performed once after each closing.<br>----------<br>Verify seal leakage rate is ≤ [200] scfh when the gap between the door seals is pressurized to ≥ [11.5] psig. | [72 hours |
| SR 3.6.5.2.2 | Verify drywell air lock seal air flask pressure is ≥ [90] psig. | [7 days |
| SR 3.6.5.2.3 | ----------NOTE----------<br>Only required to be performed upon entry into drywell.<br>----------<br>Verify only one door in the drywell air lock can be opened at a time. | [18 months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.2.4 | ----------NOTE----------<br>An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test.<br>----------<br><br>Verify overall drywell air lock leakage rate is ≤ [200] scfh by performing an overall air lock leakage test at ≥ [11.5] psig. | [18 months |
| SR 3.6.5.2.5 | Verify, from an initial pressure of [90] psig, the drywell air lock seal pneumatic system pressure does not decay at a rate equivalent to > [30] psig for a period of [10] days. | [[18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1 and D.2

If the inoperable drywell air lock cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.2.1

This SR requires a test be performed to verify seal leakage of the drywell air lock doors at pressures ≥ [11.5] psig. A seal leakage rate limit of ≤ [200] scfh has been established to ensure the integrity of the seals. The Surveillance is only required to be performed once after each closing. The Frequency of 72 hours is based on operating experience and is considered adequate in view of the other indications available to plant operations personnel that the seal is intact.

INSERT 2

SR 3.6.5.2.2

periodically

Every 7 days the drywell air lock seal air flask pressure is verified to be ≥ [90] psig to ensure that the seal system remains viable. It must be checked because it could bleed down during or following access through the air lock, which occurs regularly. The 7 day Frequency has been shown to be acceptable, based on operating experience, and is considered adequate in view of the other indications to the plant operations personnel that the seal air flask pressure is low.

SR 3.6.5.2.3

The air lock door interlock is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of the air lock are designed to withstand the maximum expected post accident drywell pressure, closure of either door will support drywell OPERABILITY. Thus, the door interlock feature supports drywell OPERABILITY while the air lock is being used for personnel transit in and out of the drywell. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer

BASES

SURVEILLANCE REQUIREMENTS (continued)

door opening will not inadvertently occur. [Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is only challenged when drywell is entered, this test is only required to be performed once every [18] months. 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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

The Surveillance is modified by a Note requiring the Surveillance to be performed only upon entry into the drywell.

INSERT 2

SR 3.6.5.2.4

This SR requires a test to be performed to verify overall air lock leakage of the drywell air lock at pressures ≥ [11.5] psig. [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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR has been modified by a Note indicating that an inoperable air lock door does not invalidate the previous successful performance of an 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.

SR 3.6.5.2.5

This SR ensures that the drywell air lock seal pneumatic system pressure does not decay at an unacceptable rate. The air lock seal will support drywell OPERABILITY down to a pneumatic pressure of [90] psig. Since the air lock seal air flask pressure is verified in SR 3.6.5.2.2 to be ≥ [90] psig, a decay rate ≤ [30] psig over [10] days is acceptable. The [10] day interval is based on engineering judgment, considering that there is no postulated DBA where the drywell is still pressurized [10] days after the event.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 2

REFERENCES

1. 10 CFR 50, Appendix J.
2. FSAR, Chapters [6 and 15].

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.6.5.3.1 | [ Verify each [ ] inch drywell purge isolation valve is sealed closed. | [31 days] |
| SR 3.6.5.3.2 | ----------NOTE----------<br>[ Not required to be met when the drywell purge supply or exhaust valves are open for pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open [provided the [20] inch containment [purge system supply and exhaust] lines are isolated].<br>----------<br>Verify each [20] inch drywell purge isolation valve is closed. | [31 days] |
| SR 3.6.5.3.3 | ----------NOTE----------<br>Not required to be met for drywell isolation valves that are open under administrative controls.<br>----------<br>Verify each drywell isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. | Prior to entering MODE 2 or 3 from MODE 4, if not performed in the previous 92 days |
| SR 3.6.5.3.4 | Verify the isolation time of each power operated, automatic drywell isolation valve is within limits. | [In accordance with the Inservice Testing Program or 92 days] |
| SR 3.6.5.3.5 | Verify each automatic drywell isolation valve actuates to the isolation position on an actual or simulated isolation signal. | [18] months |
| SR 3.6.5.3.6 | [ Verify each [ ] inch drywell purge isolation valve is blocked to restrict the valve from opening > [50]%. | [18] months] |

INSERT 1

BASES

ACTIONS (continued)

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two isolation valves. For penetration flow paths with one drywell isolation valve, Condition A provides the appropriate Required Actions.

C.1 and C.2

If any Required Action and associated Completion Time cannot be met, the plant must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

[ SR 3.6.5.3.1

periodically

Each [ ] inch drywell purge isolation valve is required to be verified sealed closed at 31 day intervals. This Surveillance is intended to be used for drywell purge isolation valves that are not qualified to open under accident conditions. This SR is designed to ensure that a gross breach of drywell is not caused by an inadvertent or spurious drywell purge isolation valve opening. Detailed analysis of these [ ] inch drywell purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to support drywell OPERABILITY. Therefore, these valves are required to be in sealed closed position during MODES 1, 2, and 3. These [ ] inch drywell purge valves that are sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leakage within limits. The Frequency is a result of the NRC resolution of Generic Issue B-24 (Ref. 3) related to purge valve use during unit operations. ]

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.6.5.3.2

This SR ensures that the [20] inch drywell purge isolation valves are closed as required or, if open, open for an allowable reason. This SR is intended to be used for drywell purge isolation valves that are fully qualified to close under accident conditions; therefore, these valves are allowed to be open for limited periods of time. This SR has been modified by a Note indicating the SR is not required to be met when the drywell purge supply or exhaust valves are open for pressure control, ALARA or air quality considerations for personnel entry, or surveillances that require the valve to be open [provided the [20] inch containment [purge system supply and exhaust] lines are isolated]. [The 31 day Frequency is consistent with the valve requirements discussed under SR 3.6.5.3.1. ]

INSERT 2

SR 3.6.5.3.3

This SR requires verification that each drywell isolation manual valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that drywell bypass leakage is maintained to a minimum. Since these valves are inside primary containment, the Frequency specified as "prior to entering MODE 2 or 3 from MODE 4, if not performed in the previous 92 days," is appropriate because of the inaccessibility of the drywell isolation valves and because these drywell isolation valves are operated under administrative controls and the probability of their misalignment is low. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

A Note has been included to clarify that valves that are open under administrative controls are not required to meet the SR during the time the valves are open.

SR 3.6.5.3.4

The isolation time is in accordance with the Inservice Testing Program.

Verifying that the isolation time of each power operated, automatic drywell isolation valve is within limits is required to demonstrate OPERABILITY. The isolation time test ensures the valve will isolate in a time period less than or equal to that assumed in the safety analysis. [The isolation time ~~and~~ Frequency of this SR ~~are~~ is [in accordance with the Inservice Testing Program or 92 days].

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.5.3.5

Verifying that each automatic drywell isolation valve closes on a drywell isolation signal is required to prevent bypass leakage from the drywell following a DBA. This SR ensures each automatic drywell isolation valve will actuate to its isolation position on a drywell isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.1.6 overlaps this SR to provide complete testing of the safety function. [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, since isolation of penetrations would eliminate cooling water flow and disrupt the normal operation of many critical components. Operating experience has shown 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.

INSERT 2

SR 3.6.5.3.6

Verifying that each [ ] inch drywell purge valve is blocked to restrict opening to > [50]% is required to ensure that the valves can be closed under DBA conditions within the time limits assumed in the safety analyses.

[The [18] month Frequency is appropriate because the blocking devices are typically removed only during a refueling outage.

REFERENCES

1. FSAR, Section [6.2.4].
2. FSAR, Table [6.2-44].
3. Generic Issue B-24.

## 3.6 CONTAINMENT SYSTEMS

### 3.6.5.4 Drywell Pressure

LCO 3.6.5.4 Drywell-to-primary containment differential pressure shall be [≥ -0.26 psid and ≤ 2.0 psid].

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Drywell-to-primary containment differential pressure not within limits. | A.1 Restore drywell-to-primary containment differential pressure to within limits. | 1 hour |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.4.1 | Verify drywell-to-primary containment differential pressure is within limits. | [12 hours ← INSERT 1 |

BASES

LCO

A limitation on the drywell-to-primary containment differential pressure of [≥ -0.26 psid and ≤ 2.0 psid] is required to ensure that suppression pool water is not forced over the weir wall, vent clearing does not occur during normal operation, containment conditions are consistent with the safety analyses, and LOCA drywell pressures and pool swell loads are within design values.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to the primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining the drywell-to-primary containment differential pressure limitation is not required in MODE 4 or 5.

ACTIONS

A.1

With drywell-to-primary containment differential pressure not within the limits of the LCO, it must be restored within 1 hour. The Required Action is necessary to return operation to within the bounds of the safety analyses. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.5.1, "Drywell," which requires that the drywell be restored to OPERABLE status within 1 hour.

B.1 and B.2

If drywell-to-primary containment differential pressure cannot be restored to within limits within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.4.1

This SR provides assurance that the limitations on drywell-to-primary containment differential pressure stated in the LCO are met. The 12 hour Frequency of this SR was developed, based on operating experience related to trending of drywell pressure variations during the applicable MODES and to assessing proximity to the specified LCO pressure limits. 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 drywell pressure condition.

INSERT 2

## 3.6 CONTAINMENT SYSTEMS

### 3.6.5.5 Drywell Air Temperature

LCO 3.6.5.5 Drywell average air temperature shall be ≤ [135]°F.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Drywell average air temperature not within limit. | A.1 Restore drywell average air temperature to within limit. | 8 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.<br>AND<br>B.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.5.1 | Verify drywell average air temperature is within limit. | [24 hours INSERT 1 |

BASES

ACTIONS

A.1

When the drywell average air temperature is not within the limit of the LCO, it must be restored within 8 hours. The Required Action is necessary to return operation to within the bounds of the safety analyses. The 8 hour Completion Time is acceptable, considering the sensitivity of the analyses to variations in this parameter, and provides sufficient time to correct minor problems.

B.1 and B.2

If drywell average air temperature cannot be restored to within limit within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.5.1

Verifying that the drywell average air temperature is within the LCO limit ensures that operation remains within the limits assumed for the drywell analysis. Drywell air temperature is monitored in all quadrants and at various elevations. Since the measurements are uniformly distributed, an arithmetic average is an accurate representation of actual drywell average temperature.

INSERT 2

The 24 hour Frequency of the SR was developed based on operating experience related to variations in drywell average air temperature variations during the applicable MODES. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal drywell air temperature condition.

REFERENCES

1. FSAR, Section [6.2].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.6.1 | ----------NOTES----------<br>1. Not required to be met for drywell purge vacuum relief breakers open during Surveillances.<br>2. Not required to be met for vacuum breakers open when performing their intended function.<br>---------- | |
| | Verify each vacuum breaker and its associated isolation valve is closed. | [7 days |
| SR 3.6.5.6.2 | Perform a functional test of each vacuum breaker and its associated isolation valve. | [31 days |
| SR 3.6.5.6.3 | Verify the opening setpoint of each vacuum breaker is ≤ [1.0] psid. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1 and E.1

With [two] drywell purge vacuum relief subsystems inoperable or with [two] drywell post-LOCA and one drywell purge vacuum relief subsystems inoperable, for reasons other than being not closed, at least one inoperable subsystem must be restored to OPERABLE status within 72 hours. In these Conditions, only one [10] inch line remains available. The 72 hour Completion Time takes into account at least one vacuum relief subsystem is still OPERABLE, a reasonable time for repairs, and the low probability of an event requiring the vacuum relief subsystems to function occurring during this period.

F.1, F.2, G.1, and G.2

If the inoperable drywell vacuum relief subsystem(s) cannot be closed or restored to OPERABLE status within the required Completion Time, or if two drywell purge vacuum relief subsystems are inoperable, for reasons other than being not closed, and one or two drywell post-LOCA vacuum relief subsystem(s) are inoperable, for reasons other than being not closed, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.6.1

Each vacuum breaker and its associated isolation valve is verified to be closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker or associated isolation valve position indication or by verifying that the vacuum breakers are closed when a differential pressure of [1.0] psid between the drywell and primary containment is maintained for 1 hour without makeup. [The 7 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker or isolation valve status available to the plant personnel, and has been shown to be acceptable through operating experience.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

Two Notes are added to this SR. The first Note allows drywell vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening drywell vacuum breakers are controlled by plant procedures and do not represent inoperable drywell vacuum breakers. A second Note is included to clarify that vacuum breakers open due to an actual differential pressure are not considered as failing this SR.

SR 3.6.5.6.2

Each vacuum breaker and its associated isolation valve must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This provides assurance that the safety analysis assumptions are valid. A 31 day Frequency was chosen to provide additional assurance that the vacuum breakers and their associated isolation valves are OPERABLE.

INSERT 2

SR 3.6.5.6.3

Verification of the vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption that the vacuum breaker will open fully at a differential pressure of [1.0] psid is valid. 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. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES 1. FSAR, Section [6.2].

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.7.1.1 | [ Verify the water level of each [UHS] cooling tower basin is ≥ [7.25] ft. | [24 hours ] |
| SR 3.7.1.2 | [ Verify the water level [in each SSW pump well of the intake structure] is ≥ [ ] ft. | [24 hours ] |
| SR 3.7.1.3 | [ Verify the average water temperature of [UHS] is ≤ [ ]°F. | [24 hours ] |
| SR 3.7.1.4 | [ Operate each [SSW] cooling tower fan for ≥ [15] minutes. | [31 days ] |
| SR 3.7.1.5 | ----------NOTE---------- Isolation of flow to individual components does not render [SSW] System inoperable. ---------- Verify each [SSW] subsystem manual, power operated, and automatic valve in the flow path servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.7.1.6 | Verify each [SSW] subsystem actuates on an actual or simulated initiation signal. | [[18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1 and D.2

If the [SSW] subsystem cannot be restored to OPERABLE status within the associated Completion Time, or both [SSW] subsystems are inoperable [for reasons other than Condition A], or the [[UHS] is determined inoperable for reasons other than Condition A or B], the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

[ SR 3.7.1.1

This SR ensures adequate long term (30 days) cooling can be maintained. With the [UHS] water source below the minimum level, the affected [SSW] subsystem must be declared inoperable. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. ]

[ SR 3.7.1.2

This SR verifies the water level [in each [SSW] pump well of the intake structure] to be sufficient for the proper operation of the [SSW] pumps (net positive suction head and pump vortexing are considered in determining this limit). The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. ]

INSERT 2

[ SR 3.7.1.3

Verification of the [UHS] temperature ensures that the heat removal capability of the [SSW] System is within the assumptions of the DBA analysis. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. ]

BASES

SURVEILLANCE REQUIREMENTS (continued)

[ SR 3.7.1.4

Operating each cooling tower fan for ≥ 15 minutes ensures that all fans are OPERABLE and that all associated controls are functioning properly. It also ensures that fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the cooling tower fans occurring between Surveillances. ]

SR 3.7.1.5

Verifying the correct alignment for each manual, power operated, and automatic valve in each [SSW] subsystem flow path provides assurance that the proper flow paths will exist for [SSW] operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position and yet considered in the correct position, provided it can be automatically realigned to its accident position. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

INSERT 2

This SR is modified by a Note indicating that isolation of the [SSW] System to components or systems may render those components or systems inoperable, but does not affect the OPERABILITY of the [SSW] System. As such, when all [SSW] pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the [SSW] System is still OPERABLE.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.1.6

This SR verifies that the automatic isolation valves of the [SSW] System will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident event. This is demonstrated by use of an actual or simulated initiation signal. This SR also verifies the automatic start capability of the [SSW] pump and cooling tower fans in each subsystem. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.5.1.6 overlaps this SR to provide complete testing of the safety function.

INSERT 2

Operating experience has shown that these components usually pass the SR when performed on the [18] month Frequency. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.

REFERENCES

1. Regulatory Guide 1.27, Revision 2, January 1976.
2. FSAR, Section [9.2.1].
3. FSAR, Table [9.2-3].
4. FSAR, Section [6.2.1.1.3.3.1.6].
5. FSAR, Chapter [15].
6. FSAR, Section [6.2.2.3].
7. FSAR, Table [6.2-2].

## 3.7 PLANT SYSTEMS

### 3.7.2 High Pressure Core Spray (HPCS) Service Water System (SWS)

LCO 3.7.2 The HPCS SWS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. HPCS SWS inoperable. | A.1 Declare HPCS System inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.2.1 | Verify water level of the [a standby service water] cooling tower basin is ≥ [7.25] ft. | [24 hours |
| SR 3.7.2.2 | ----------NOTE---------- Isolation of flow to individual components does not render [HPCS SWS] System inoperable. ---------- Verify each HPCS SWS manual, power operated, and automatic valve in the flow path [servicing safety related systems or components], that is not locked, sealed, or otherwise secured in position, is in the correct position. | [31 days |
| SR 3.7.2.3 | Verify the HPCS SWS actuates on an actual or simulated initiation signal. | [[18] months |

INSERT 1

BASES

APPLICABILITY

In MODES 1, 2, and 3, the HPCS SWS is required to be OPERABLE to support OPERABILITY of the HPCS System since it is required to be OPERABLE in these MODES.

In MODES 4 and 5, the OPERABILITY requirements of the HPCS SWS and the UHS are determined by the HPCS System.

ACTIONS

A.1

When the HPCS SWS is inoperable, the capability of the HPCS System to perform its intended function cannot be ensured. Therefore, if the HPCS SWS is inoperable, the HPCS System must be declared inoperable immediately and Condition C of LCO 3.5.1, "ECCS - Operating," entered.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR ensures that adequate cooling can be maintained. With the UHS water source below the minimum level, the HPCS SWS must be declared inoperable. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.

INSERT 2

SR 3.7.2.2

Verifying the correct alignment for each manual, power operated, and automatic valve in the HPCS service water flow path provides assurance that the proper flow paths will exist for HPCS service water operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in correct position prior to locking, sealing, or securing.

A valve is also allowed to be in the nonaccident position and yet considered in the correct position, provided it can be automatically realigned to its accident position within the required time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This SR is modified by a Note indicating that isolation of the [HPCS SWS] System to components or systems may render those components or systems inoperable, but does not affect the OPERABILITY of the [HPCS SWS] System. As such, when all [HPCS SWS] pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the [HPCS SWS] System is still OPERABLE.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

INSERT 2

SR 3.7.2.3

This SR verifies that the automatic valves of the HPCS SWS will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident event. This is demonstrated by use of an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.5.1.5 overlaps this SR to provide complete testing of the safety function.

Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [9.2.1].
2. FSAR, Chapter [6].
3. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. Two [CRFA] subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs. | ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- | |
| | F.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment]. | Immediately |
| | AND | |
| | F.2 Initiate action to suspend OPDRVs. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.3.1 | Operate each [CRFA] subsystem for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes]. | [31 days |
| SR 3.7.3.2 | Perform required [CRFA] filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)]. | In accordance with the [VFTP] |
| SR 3.7.3.3 | Verify each [CRFA] subsystem actuates on an actual or simulated initiation signal. | [[18] months |
| SR 3.7.3.4 | [ Verify each [CRFA] subsystem can maintain a positive pressure of ≥ [ ] inches water gauge relative to [adjacent buildings] during the [isolation] mode of operation at a flow rate of ≤ [ ] cfm. | [[18] months on a STAGGERED TEST BASIS] |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

≥ 15 minutes to demonstrate the function of the system.] [Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.

SR 3.7.3.2

This SR verifies that the required CRFA testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The [VFTP] includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the [VFTP].

INSERT 2

SR 3.7.3.3

This SR verifies that each [CRFA] subsystem starts and operates on an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.5 overlaps this SR to provide complete testing of the safety function. [The [18] month Frequency is specified in Reference 5.

SR 3.7.3.4

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper function of the [CRFA] System. During the emergency mode of operation, the [CRFA] System is designed to slightly pressurize the control room to [0.1] inches water gauge positive pressure with respect to adjacent areas to prevent unfiltered inleakage. The [CRFA] System is designed to maintain this positive pressure at a flow rate of [500] cfm to the control room in the isolation mode.[The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with industry practice and other filtration system SRs.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | C.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].<br><br>AND<br><br>C.2.2 Initiate action to suspend OPDRVs. | Immediately<br><br><br><br><br>Immediately |
| D. Two [control room AC] subsystems inoperable in MODE 1, 2, or 3. | D.1 Enter LCO 3.0.3. | Immediately |
| E. Two [control room AC] subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs. | ----------NOTE----------<br>LCO 3.0.3 is not applicable.<br>----------<br><br>E.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].<br><br>AND<br><br>E.2 Initiate action to suspend OPDRVs. | <br><br><br><br>Immediately<br><br><br><br><br>Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.4.1 | Verify each [control room AC] subsystem has the capability to remove the assumed heat load. | [18] months |

INSERT 1

BASES

ACTIONS (continued)

D.1

If both [control room AC] subsystems are inoperable in MODE 1, 2, or 3, the [Control Room AC] System may not be capable of performing the intended function. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

The Required Actions of Condition E.1 are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs with two [control room AC] subsystems inoperable, action must be taken to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, handling of [recently] irradiated fuel in the [primary or secondary containment] must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load assumed in the [safety analyses]. The SR consists of a combination of testing and calculation. [The [18] month Frequency is appropriate since significant degradation of the [Control Room AC] System is not expected over this time period.

INSERT 2

REFERENCES

1. FSAR, Section [6.4].
2. FSAR, Section [9.4.1].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.5.1 | ----------NOTE----------<br>Not required to be performed until 31 days after any [main steam line not isolated and] SJAE in operation.<br>----------<br><br>Verify the gross gamma activity rate of the noble gases is ≤ [380] mCi/second [after decay of 30 minutes]. | [31 days ← Insert 1]<br><br>AND<br><br>Once within 4 hours after a ≥ 50% increase in the nominal steady state fission gas release after factoring out increases due to changes in THERMAL POWER level |

BASES

ACTIONS

A.1

If the offgas radioactivity rate limit is exceeded, 72 hours is allowed to restore the gross gamma activity rate to within the limit. The 72 hour Completion Time is reasonable, based on engineering judgment considering the time required to complete the Required Action, the large margins associated with permissible dose and exposure limits, and the low probability of a Main Condenser Offgas System rupture occurring.

B.1, B.2, B.3.1, and B.3.2

If the gross gamma activity rate is not restored to within the limits within the associated Completion Time, [all main steam lines] or the SJAE must be isolated. This isolates the Main Condenser Offgas System from the source of the radioactive steam. The main steam lines are considered isolated if at least one main steam isolation valve in each main steam line is closed, and at least one main steam line drain valve in each drain line is closed. The 12 hour Completion Time is reasonable, based on operating experience, to perform the actions from full power conditions in an orderly manner and without challenging unit systems.

An alternative to Required Actions B.1 and B.2 is to place the unit in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

This SR on a 31 day Frequency requires an isotopic analysis of an offgas sample to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-135, Xe-138, Kr-85, Kr-87, and Kr-88. If the measured rate of radioactivity increases significantly (by ≥ 50% after correcting for expected increases due to changes in THERMAL POWER), an isotopic analysis is also performed within 4 hours after the increase is noted, to ensure that the increase is not indicative of a sustained increase in the radioactivity rate. The 31 day Frequency is adequate in view of other instrumentation that continuously monitor the offgas, and is acceptable based on operating experience.

INSERT 2

This SR is modified by a Note indicating that the SR is not required to be performed until 31 days after any [main steam line is not isolated] and the SJAE is in operation. Only in this condition can radioactive fission gases be in the Main Condenser Offgas System at significant rates.

## 3.7 PLANT SYSTEMS

### 3.7.6 Main Turbine Bypass System

LCO 3.7.6 The Main Turbine Bypass System shall be OPERABLE.

OR

The following limits are made applicable:

[ a. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," limits for an inoperable Main Turbine Bypass System, as specified in the [COLR] and ]

[ b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for an inoperable Main Turbine Bypass System, as specified in the [COLR]. ]

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. [Requirements of the LCO not met or Main Turbine Bypass System inoperable.] | A.1 [Satisfy the requirements of the LCO or restore Main Turbine Bypass System to OPERABLE status.] | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Reduce THERMAL POWER to < 25% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.6.1 | Verify one complete cycle of each main turbine bypass valve. | [31 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.6.2 | Perform a system functional test. | [18] months |
| SR 3.7.6.3 | Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits. | [18] months |

Insert 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

Cycling each main turbine bypass valve through one complete cycle of full travel demonstrates that the valves are mechanically OPERABLE and will function when required. The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.6.2

The Main Turbine Bypass System is required to actuate automatically to perform its design function. This SR demonstrates that, with the required system initiation signals, the valves will actuate to their required position. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the [18] month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.

INSERT 2

SR 3.7.6.3

This SR ensures that the TURBINE BYPASS SYSTEM RESPONSE TIME is in compliance with the assumptions of the appropriate safety analysis. The response time limits are specified in [unit specific documentation]. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the [18] month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [7.7.1.5].
2. FSAR, Section [15.1.2].

## 3.7 PLANT SYSTEMS

### 3.7.7 Fuel Pool Water Level

LCO 3.7.7 The fuel pool water level shall be ≥ [23] ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool and upper containment fuel storage pool racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the associated fuel storage pool.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.7.1 | Verify the fuel pool water level is ≥ [23] ft over the top of irradiated fuel assemblies seated in the storage racks. | [7 days INSERT 1 |

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

When the initial conditions for an accident cannot be met, steps should be taken to preclude the accident from occurring. With either fuel pool level less than required, the movement of irradiated fuel assemblies in the associated storage pool is suspended immediately. Suspension of this activity shall not preclude completion of movement of an irradiated fuel assembly to a safe position. This effectively precludes a spent fuel handling accident from occurring.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This SR verifies that sufficient water is available in the event of a fuel handling accident. The water level in the spent fuel storage pool and upper containment fuel storage racks must be checked periodically. [The 7 day Frequency is acceptable, based on operating experience, considering that the water volume in the pool is normally stable and water level changes are controlled by unit procedures.

INSERT 2

REFERENCES

1. FSAR, Section [9.1.2].
2. FSAR, Section [15.7.4].
3. FSAR, Section [15.7.6].
4. NUREG-0800, Section 15.7.4, Revision 1, July 1981.
5. Regulatory Guide 1.52, Rev. [2].
6. Regulatory Guide 1.25, March 1972.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| G. Required Action and associated Completion Time of Condition A, B, C, D, E, or [F] not met. | G.1 Be in MODE 3.<br><br>AND<br><br>G.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |
| H. Three or more [required] AC sources inoperable. | H.1 Enter LCO 3.0.3. | 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 |
| SR 3.8.1.2 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.<br><br>[ 2. 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. ]<br>----------<br><br>Verify each DG starts from standby conditions and achieves steady state voltage ≥ [3744] V and ≤ [4576] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.3 | ----------NOTES----------<br>1. DG loadings may include gradual loading as recommended by the manufacturer.<br>2. Momentary transients outside the load range do not invalidate this test.<br>3. This Surveillance shall be conducted on only one DG at a time.<br>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.<br>----------<br>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ [5450] kW and ≤ [5740] kW for [Division 1 and 2] DGs, and ≥ [3300] kW and ≤ [3500] kW for [Division 3] DG. | [31 days |
| SR 3.8.1.4 | Verify each day tank [and engine mounted tank] contains ≥ [220] gal of fuel oil for [Divisions 1 and 2] and ≥ [220] gal for [Division 3]. | [31 days |
| SR 3.8.1.5 | Check for and remove accumulated water from each day tank [and engine mounted tank]. | [[31] days |
| SR 3.8.1.6 | Verify the fuel oil transfer system operates to [automatically] transfer fuel oil from storage tank[s] to the day tank [and engine mounted tank]. | [[92] days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.7 | ----------NOTE----------<br>All DG starts may be preceded by an engine prelube period.<br>----------<br><br>Verify each DG starts from standby condition and achieves:<br><br>a. In ≤ [10] seconds, voltage ≥ [3744] V and frequency ≥ [58.8] Hz and<br><br>b. Steady state voltage ≥ [3744] V and ≤ [4576] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | [184 days<br><br>INSERT 1 |
| SR 3.8.1.8 | ----------NOTE----------<br>[ 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. Credit may be taken for unplanned events that satisfy this SR. ]<br>----------<br><br>[ Verify [automatic and manual] transfer of [unit power supply] from the [normal offsite circuit to each [required] alternate offsite circuit and between the [required] alternate] offsite circuits. | [18] months ] |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.9 | ----------NOTES----------<br>[ 1. 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. Credit may be taken for unplanned events that satisfy this SR.<br><br>2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.]<br>----------<br><br>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load for [Division 1 and ≥ [550] kW for Division 2] DGs and ≥ [2180] kW for [Division 3] DG, and:<br><br>a. Following load rejection, the frequency is ≤ [69] Hz,<br><br>b. Within [3] seconds following load rejection, the voltage is ≥ [3744] V and ≤ [4576] V, and<br><br>c. Within [3] seconds following load rejection, the frequency is ≥ [58.8] Hz and ≤ [61.2] Hz. | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.10 | ----------NOTES----------<br>[1. 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. Credit may be taken for unplanned events that satisfy this SR.<br><br>2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ]<br>---------- | |
| | Verify each DG does not trip and voltage is maintained ≤ [5000] V during and following a load rejection of a load ≥ [5450] kW and ≤ [5740] kW for [Division 1 and 2] DGs and ≥ [3300] kW and ≤ [3500] kW for [Division 3] DG. | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.11 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br><br>2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify on an actual or simulated loss of offsite power signal:<br><br>a. De-energization of emergency buses,<br><br>b. Load shedding from emergency buses, and<br><br>c. DG auto-starts from standby condition and:<br><br>1. Energizes permanently connected loads in ≤ [10] seconds,<br><br>2. Energizes auto-connected shutdown loads through [automatic load sequencer],<br><br>3. Maintains steady state voltage ≥ [3744] V and ≤ [4576] V,<br><br>4. Maintains steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and<br><br>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 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br><br>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. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and:<br><br>a. In ≤ [10] seconds after auto-start and during tests, achieves voltage ≥ [3744] V frequency ≥ [58.8] Hz<br><br>b. Achieves steady state voltage ≥ [3744] V and ≤ [4576] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz,<br><br>c. Operates for ≥ [5] minutes,<br><br>d. Permanently connected loads remain energized from the offsite power system, and<br><br>e. Emergency loads are energized [or auto-connected through the automatic load sequencer] to from the offsite power system. | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.13 | ----------NOTE----------<br>[ This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ]<br>----------<br><br>Verify each DG's automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ECCS initiation signal] except:<br><br>a. Engine overspeed,<br><br>b. Generator differential current,<br><br>[ c. Low lube oil pressure,<br><br>d. High crankcase pressure, and<br><br>e. Start failure relay. ] | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.14 | ----------NOTES----------<br>1. Momentary transients outside the load and power factor ranges do not invalidate this test.<br><br>2. 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. Credit may be taken for unplanned events that satisfy this SR.<br><br>3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9] for Division 1 and 2 DGs, and ≤ [0.9] for Division 3 DG. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.<br>---------- | |
| | Verify each DG operates for ≥ 24 hours:<br><br>a. For ≥ [2] hours loaded, ≥ [5450] kW and ≤ [5740] kW for Division 1 and 2 DGs, ≥ [3630] kW and ≤ [3830] kW for Division 3 DG and<br><br>b. For the remaining hours of the test loaded ≥ [3744] kW and ≤ [4576] kW for Division 1 and 2 DGs, and ≥ [3300] kW and ≤ [3500] kW for Division 3 DG. | [18] months INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.15 | ----------NOTES----------<br>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ [2] hours loaded ≥ [4500] kW and ≤ [5000] kW for [Division 1 and 2] DGs, and ≥ [3300] kW and ≤ [3500] kW for Division 3 DG.<br><br>Momentary transients outside of load range do not invalidate this test.<br><br>2. All DG starts may be preceded by an engine prelube period.<br>----------<br><br>Verify each DG starts and achieves:<br><br>a. In ≤ [10] seconds, voltage ≥ [3744] V and frequency ≥ [58.8] Hz and<br><br>b. Steady state voltage ≥ [3744] V and ≤ [4576] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | [18] months |
| SR 3.8.1.16 | ----------NOTE----------<br>This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify each DG:<br><br>a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power,<br><br>b. Transfers loads to offsite power source, and<br><br>c. Returns to ready-to-load operation. | [18] months |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.17 | ----------NOTE----------<br>This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by:<br><br>a. Returning DG to ready-to-load operation and<br><br>[ b. Automatically energizing the emergency load from offsite power. ] | [[18] months |
| SR 3.8.1.18 | ----------NOTE----------<br>[ This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ]<br>----------<br><br>[ Verify interval between each sequenced load block is within ± [10% of design interval] [for each load sequencer timer]. | [[18] months ] |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.19 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br><br>2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:<br><br>a. De-energization of emergency buses,<br><br>b. Load shedding from emergency buses, and<br><br>c. DG auto-starts from standby condition and:<br><br>1. Energizes permanently connected loads in ≤ [10] seconds,<br><br>2. Energizes auto-connected emergency loads through [load sequencer],<br><br>3. Achieves steady state voltage ≥ [3744] V and ≤ [4576] V,<br><br>4. Achieves steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and<br><br>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----------<br>All DG starts may be preceded by an engine prelube period.<br>----------<br><br>Verify, when started simultaneously from standby condition, [each] [Division 1, 2, and 3] DG achieves:<br><br>a. In ≤ [10] seconds, voltage ≥ [3744] V and frequency ≥ [58.8] Hz and<br><br>b. Steady state voltage ≥ [3744] V and ≤ [4576] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. | 10 years INSERT 1 |

BASES

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, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages under simulated accident conditions. The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10).

Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of [3740] V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1 (Ref. 11), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90%, or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of [4576] V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. 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 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.

INSERT 2

SR 3.8.1.2 and SR 3.8.1.7

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs have been modified by Notes (Note 1 for SR 3.8.1.2 and Note for SR 3.8.1.7) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

For the purposes of this testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

[ In order to reduce stress and wear on diesel engines, some manufacturers recommend that the starting speed of DGs be limited, that warmup be limited to this lower speed, and that DGs be gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 2, which is only applicable when such procedures are recommended by the manufacturer. ]

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions in the design basis LOCA analysis (Ref. 10). The 10 second start requirement may not be applicable to SR 3.8.1.2 (see Note 2 of SR 3.8.1.2), 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 does require 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.

INSERT 2

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

The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.3

This Surveillance demonstrates that the DGs are capable of synchronizing and accepting 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 [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.

INSERT 2

[The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3).

Note 1 modifies this Surveillance to indicate that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized.

Note 2 modifies this Surveillance by stating that momentary transients because of changing bus loads do not invalidate this test.

Note 3 indicates that this Surveillance must 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 [and engine mounted tank] is at or above the level at which fuel oil is automatically added. 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%.

BASES

SURVEILLANCE REQUIREMENTS (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

periodic

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 [and engine mounted] tanks once every [31] days eliminates the necessary environment for bacterial survival. This is most effective means in 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 preventive maintenance. The presence of water does not necessarily represent a failure of this SR provided that accumulated water is removed during performance of this Surveillance.

INSERT 2

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. It is required to support the 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 for this SR is variable, depending on individual system design, with up to a 92 day interval. The 92 day Frequency corresponds to the testing requirements for pumps as contained in the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 12); however, the design of fuel transfer systems is such that pumps operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.7

See SR 3.8.1.2.

[ SR 3.8.1.8

Transfer of each 4.16 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 plant 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 on the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. INSERT 2

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, plant 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. ] Credit may be taken for unplanned events that satisfy this SR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 load referenced for DG 11 is the 1200 kW low pressure core spray pump; for DG 12, the 550 kW residual heat removal (RHR) pump; and for DG 13 the 2180 kW HPCS pump. The Standby Service Water (SSW) pump values are not used as the largest load since the SSW supplies cooling to the associated DG. If this load were to trip, it would result in the loss of the DG. This Surveillance may be accomplished by:

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. 13), 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. For the Grand Gulf Nuclear Station these values are the same.

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 the 5 second load sequence interval associated with sequencing of this 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 and SR 3.8.1.9.c are steady state voltage and frequency values 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).

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

----------REVIEWER'S NOTE----------
The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.
---

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 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.

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing must be performed using a power factor ≤ [0.9]. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

INSERT 2

[The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9) and is intended to be consistent with expected fuel cycle lengths.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. INSERT 2

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, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations for [Division 1 and 2] DGs. [For the [Division 3] DG, standby conditions mean that the lube oil is heated and continuously circulated through a portion of the system as recommended by the vendor. Engine jacket water is heated by the lubricating oil and circulates through the system by natural circulation.] 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 plant 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. Credit may be taken for unplanned events that satisfy this SR.

[ SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time ([10] seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ [5] minutes. The [5] minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ECCS signal without loss of offsite power.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 loading logic for loading onto offsite power. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, high pressure injection systems are not capable of being operated at full flow, or 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 the connection and loading of these loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of [18 months] takes into consideration plant 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. INSERT 2

This SR is modified by two Notes. The reason for the 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, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 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, plant 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Credit may be taken for unplanned events that satisfy this SR. ]

SR 3.8.1.13

This Surveillance demonstrates that DG non-critical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ECCS initiation test signal. The non-critical 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 plant 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. Insert 2

The SR is modified by a Note. The reason for the Note is that performing the Surveillance removes a required DG from service. 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. Credit may be taken for unplanned events that satisfy this SR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

----------REVIEWER'S NOTE----------
The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.
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SR 3.8.1.14

Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(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 - 22 hours of which is at a load equivalent to the continuous rating of the DG, and 2 hours of which is at a load equivalent to 110% of the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor ≤ [0.9]. This power factor is chosen to be representative of the actual design basis inductive loading that the DG could experience.

INSERT 2

The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in

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 [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(5).

This SR has been modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. 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. 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. 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.

INSERT 2

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and that the DG can be returned to ready-to-load status when offsite power is restored. It also ensures that the auto-start 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 auto-close signal on bus undervoltage, and the load sequence timers are reset.

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.1.(6), and takes into consideration plant conditions required to perform the Surveillance.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(8); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

This SR has been 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. Credit may be taken for unplanned events that satisfy this SR.

INSERT 2

SR 3.8.1.18

Under accident conditions [and loss of offsite power] loads are sequentially connected to the bus by the load sequencing panel. 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 Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(2); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 ECCS initiation 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 2

[The Frequency of [18 months] takes into consideration plant 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, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. 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 plant 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. Credit may be taken for unplanned events that satisfy this SR.

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 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 2

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, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter [8].
3. Regulatory Guide 1.9.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. Regulatory Guide 1.93.
7. Generic Letter 84-15, July 2, 1984.
8. 10 CFR 50, Appendix A, GDC 18.
9. Regulatory Guide 1.108.
10. Regulatory Guide 1.137.
11. ANSI C84.1, 1982.
12. ASME, Boiler and Pressure Vessel Code, Section XI.
13. IEEE Standard 308.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. One or more DGs with new fuel oil properties not within limits. | D.1 Restore stored fuel oil properties to within limits. | 30 days |
| E. One or more DGs with starting air receiver pressure < [225] psig and ≥ [125] psig. | E.1 Restore starting air receiver pressure to ≥ [225] psig. | 48 hours |
| F. Required Actions and associated Completion Time not met.<br><br>OR<br><br>One or more DGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E. | F.1 Declare associated DG inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.3.1 | Verify each fuel oil storage tank contains:<br><br>a. ≥ [62,000] gal of fuel for [DGs 11 and 12] and<br><br>b. ≥ [41,200] gal of fuel for [DG 13]. | [31 days INSERT 1 |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.3.2 | Verify lube oil inventory is:<br>a. ≥ [ ] gal for [DGs 11 and 12] and<br>b. ≥ [ ] gal for [DG 13]. | [31 days |
| SR 3.8.3.3 | Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program. | In accordance with the Diesel Fuel Oil Testing Program |
| SR 3.8.3.4 | Verify each DG air start receiver pressure is ≥ [225] psig. | [31 days |
| SR 3.8.3.5 | Check for and remove accumulated water from each fuel oil storage tank. | [[31] days |

INSERT 1

BASES

ACTIONS (continued)

F.1

With a Required Action and associated Completion Time not met, or the stored diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through E, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at full load. The 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

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG. The 500 gal requirement is based on the DG manufacturer's consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer's recommended minimum level.

INSERT 2

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run times are closely monitored by the plant 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 operation. If results from these tests are within

BASES

SURVEILLANCE REQUIREMENTS (continued)

Particulate concentrations should be determined in accordance with ASTM D5452-[ ] (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 volume of stored fuel oil is contained in two or more interconnected tanks, each tank must be considered and tested separately.]

The Frequency of this Surveillance takes into consideration fuel oil degradation trends indicating that particulate concentration is unlikely to change 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 system 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 the [five] starts can be accomplished.

INSERT 2

[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

Periodic

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 storage tanks ~~once every 31 days~~ eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 2). This SR is for preventive maintenance. The presence of water does not necessarily represent a failure of this SR provided that accumulated water is removed during performance of the Surveillance.

INSERT 2

REFERENCES

1. FSAR, Section [9.5.4].
2. Regulatory Guide 1.137.
3. ANSI N195, Appendix B, 1976.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. ASTM Standards: D4057-[ ]; D975-[ ]; D1298-[ ]; D4176-[ ]; [D2709-[ ];] D1552-[ ]; D2622-[ ]; D4294-[ ]; D5452-[ ].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. [Division 3] DC electrical power subsystem inoperable for reasons other than Condition A [or B]. | D.1 Declare High Pressure Core Spray System [and 2C Standby Service Water System] inoperable. | Immediately |
| E. Required Action and associated Completion Time not met. | E.1 Be in MODE 3.<br><br>AND<br><br>E.2 Be in MODE 4. | 12 hours<br><br><br><br>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 [required] battery charger supplies≥ [400] amps at greater than or equal to the minimum established float voltage for ≥ [8] hours.<br><br>OR<br><br>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----------<br>1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3.<br><br>2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | 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. | <editorial change><br>[18 months] INSERT 1 |

BASES

ACTIONS (continued)

E.1 and E.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 4 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 is supplying the 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 ([2.20] Vpc or [127.6] 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 2

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR provides two options. One option requires that each battery charger be capable of supplying [400] amps at the minimum established float voltage for [8] hours. The ampere requirements are 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 coincident 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 2

[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 the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 4.

[The 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.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.<br><br>OR<br><br>One [or two] batter[y][ies on one division] with one or more battery cells float voltage < [2.07] V and float current > [2] amps. | F.1 Declare associated battery inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.6.1 | ----------NOTE----------<br>Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1.<br>----------<br><br>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 |
| SR 3.8.6.3 | Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits. | [31 days |
| SR 3.8.6.4 | Verify each battery pilot cell temperature is greater than or equal to minimum established design limits. | [31 days |

INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.6.5 | Verify each battery connected cell voltage is ≥ [2.07] V. | [92 days |
| SR 3.8.6.6 | ----------NOTE----------<br>This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.<br>---------- | |
| | Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. | [60 months<br><br>AND<br><br>12 months when battery shows degradation, or has reached [85]% of the expected life with capacity < 100% of manufacturer's rating<br><br>AND<br><br>24 months when battery has reached [85]% of the expected life with capacity ≥ 100% of manufacturer's rating |

INSERT 1

BASES

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 the 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. 1). The 7 day Frequency is consistent with IEEE-450 (Ref. 1).

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 [130.5] V at the battery terminals, or [2.25] Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than [2.07] Vpc, are addressed in Specification 5.5.14. 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. 1).

INSERT 2

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. 1).

BASES

SURVEILLANCE REQUIREMENTS (continued)

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., [40]°F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provided 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. 1). Insert 2

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 discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test.

It may consist of just two rates; for instance, the one minute rate 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 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 1) 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 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 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to IEEE-450 (Ref. 3), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is 10% below the manufacturer's rating. All these Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1). INSERT 2

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DC electrical power subsystem 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. Credit may be taken for unplanned events that satisfy this SR.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. [ [Division 3] inverter inoperable. | B.1 Declare High Pressure Core Spray System [and 2C Standby Service Water System] inoperable. | Immediately ] |
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3.<br>AND<br>C.2 Be in MODE 4. | 12 hours<br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.7.1 | Verify correct inverter voltage, [frequency,] and alignment to required AC vital buses. | [7 days INSERT 1 |

BASES

ACTIONS (continued)

C.1 and C.2

If the inoperable devices or components cannot be restored 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 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

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 and frequency output ensures that the required power is readily 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 2

REFERENCES

1. FSAR, Chapter [8].
2. FSAR, Chapter [6].
3. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2.2 Suspend handling of [recently] irradiated fuel assemblies in the [primary or secondary] containment. | Immediately |
| | AND | |
| | A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel. | Immediately |
| | AND | |
| | A.2.4 Initiate action to restore required inverters to OPERABLE status. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.8.1 | Verify correct inverter voltage, [frequency,] and alignments to [required] AC vital buses. | [7 days INSERT 1 |

BASES

ACTIONS (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverter[s] and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the plant 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 plant 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 and frequency output ensures that the required power is readily 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 2

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. One or more [Division 1 and 2] DC electrical power distribution subsystems inoperable. | C.1 Restore [Division 1 and 2] DC electrical power distribution subsystem(s) to OPERABLE status. | 2 hours<br>AND<br>16 hours from discovery of failure to meet LCO |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Be in MODE 3.<br>AND<br>D.2 Be in MODE 4. | 12 hours<br><br>36 hours |
| E. One or more [Division 3] AC, DC, or AC vital bus electrical power distribution subsystems inoperable. | E.1 Declare High Pressure Core Spray System [and 2C Standby Service Water System] inoperable. | Immediately |
| F. Two or more electrical power distribution subsystems inoperable that result in a loss of function. | F.1 Enter LCO 3.0.3. | Immediately |

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 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

Meeting this Surveillance verifies that the 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 2

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].
3. Regulatory Guide 1.93, December 1974.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel. | Immediately |
| | AND | |
| | 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 shutdown cooling 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 |

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC vital bus electrical power distribution subsystem is functioning properly, with the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, as well as other indications available in the control room that alert the operator to subsystem malfunctions.

INSERT 2

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.1.1 | Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs:<br>a. All-rods-in,<br>b. Refuel platform position, and<br>c. Refuel platform [main] hoist, fuel loaded. | [7 days INSERT 1 |

BASES

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. Therefore, Required Action A.1 requires that in-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position.

Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will remain inserted). Required Action A.2.2 is performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1.

Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel. Insert 2

## 3.9 REFUELING OPERATIONS

### 3.9.2 Refuel Position One-Rod-Out Interlock

LCO 3.9.2 The refuel position one-rod-out interlock shall be OPERABLE.

APPLICABILITY: MODE 5 with the reactor mode switch in the refuel position and any control rod withdrawn.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Refuel position one-rod-out interlock inoperable. | A.1 | Suspend control rod withdrawal. | Immediately |
| | AND | | |
| | A.2 | Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |

SURVEILLANCE REQUIREMENTS

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

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

INSERT 2

The Frequency of 12 hours is sufficient in view of other administrative controls utilized during refueling operations to ensure safe operation.

SR 3.9.2.2

Performance of a CHANNEL FUNCTIONAL TEST on each channel demonstrates the associated refuel position one-rod-out interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. The 7 day Frequency is considered adequate because of demonstrated circuit reliability, procedural controls on control rod withdrawals, and visual and audible indications available in the control room to alert the operator of control rods not fully inserted. To perform the required testing, the applicable condition must be entered (i.e., a control rod must be withdrawn from its full-in position). Therefore, SR 3.9.2.1 has been modified by a Note that states the CHANNEL FUNCTIONAL TEST is not required to be performed until 1 hour after any control rod is withdrawn.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section [7.6.1.1].
3. FSAR, Section [15.4.1.1].

## 3.9 REFUELING OPERATIONS

### 3.9.3 Control Rod Position

LCO 3.9.3 All control rods shall be fully inserted.

APPLICABILITY: When loading fuel assemblies into the core.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more control rods not fully inserted. | A.1 Suspend loading fuel assemblies into the core. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.3.1 | Verify all control rods are fully inserted. | [12 hours INSERT 1 |

BASES

APPLICABILITY

During MODE 5, loading fuel into core cells with control rods withdrawn may result in inadvertent criticality. Therefore, the control rods must be inserted before loading fuel into a core cell. All control rods must be inserted before loading fuel to ensure that a fuel loading error does not result in loading fuel into a core cell with the control rod withdrawn.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and no fuel loading activities are possible. Therefore, this Specification is not applicable in these MODES.

ACTIONS

A.1

With all control rods not fully inserted during the applicable conditions, an inadvertent criticality could occur that is not analyzed in the FSAR. All fuel loading operations must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

During refueling, to ensure that the reactor remains subcritical, all control rods must be fully inserted prior to and during fuel loading. Periodic checks of the control rod position ensure this condition is maintained.

The 12 hour Frequency takes into consideration the procedural controls on control rod movement during refueling as well as the redundant functions of the refueling interlocks. Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR Section [15.4.1.1].

## 3.9 REFUELING OPERATIONS

### 3.9.5 Control Rod OPERABILITY - Refueling

LCO 3.9.5 Each withdrawn control rod shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more withdrawn control rods inoperable. | A.1 Initiate action to fully insert inoperable withdrawn control rods. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.5.1 | ----------NOTE----------<br>Not required to be performed until 7 days after the control rod is withdrawn.<br>----------<br>Insert each withdrawn control rod at least one notch. | 7 days |
| SR 3.9.5.2 | Verify each withdrawn control rod scram accumulator pressure is ≥ [1520] psig. | 7 days |

BASES

APPLICABILITY (continued)

For MODES 1 and 2, control rod requirements are found in LCO 3.1.2, "Reactivity Anomalies," LCO 3.1.3, "Control Rod OPERABILITY," LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators." During MODES 3 and 4, control rods are not able to be withdrawn since the reactor mode switch is in shutdown and a control rod block is applied. This provides adequate requirements for control rod OPERABILITY during these conditions.

ACTIONS

A.1

With one or more withdrawn control rods inoperable, action must be immediately initiated to fully insert the inoperable control rod(s). Inserting the control rod(s) ensures that the shutdown and scram capabilities are not adversely affected. Actions must continue until the inoperable control rod(s) is fully inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2

During MODE 5, the OPERABILITY of control rods is primarily required to ensure that a withdrawn control rod will automatically insert if a signal requiring a reactor shutdown occurs. Because no explicit analysis exists for automatic shutdown during refueling, the shutdown function is satisfied if the withdrawn control rod is capable of automatic insertion and the associated CRD scram accumulator pressure is ≥ [1520] psig.

INSERT 2

The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.

SR 3.9.5.1 is modified by a Note that allows 7 days after withdrawal of the control rod to perform the Surveillance. This acknowledges that the control rod must first be withdrawn before performance of the Surveillance, and therefore avoids potential conflicts with SR 3.0.3 and SR 3.0.4.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.

2. FSAR, Section [15.4.1.1].

## 3.9 REFUELING OPERATIONS

### 3.9.6 [Reactor Pressure Vessel (RPV)] Water Level - [ Irradiated Fuel]

LCO 3.9.6 [RPV] water level shall be ≥ [22 ft 8 inches] above the top of the [RPV flange].

APPLICABILITY: During movement of irradiated fuel assemblies within the [RPV],
[ During movement of new fuel assemblies or handling of control rods within the [RPV], when irradiated fuel assemblies are seated within the [RPV]. ]

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. [RPV] water level not within limit. | A.1 Suspend movement of fuel assemblies and handling of control rods within the [RPV]. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.6.1 | Verify [RPV] water level is ≥ [22 ft 8 inches] above the top of the [RPV flange]. | [24 hours Insert 1 |

BASES

LCO

A minimum water level of [22 ft 8 inches] above the top of the RPV flange is required to ensure that the radiological consequences of a postulated fuel handling accident are within acceptable limits, as provided by the guidance of Reference 3.

APPLICABILITY

LCO 3.9.6 is applicable when moving [irradiated] fuel assemblies [or handling control rods (i.e., movement with other than the normal control rod drive)] within the RPV. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. [If irradiated fuel is not present within the RPV, there can be no significant radioactivity release as a result of a postulated fuel handling accident.] [Requirements for handling of new fuel assemblies or control rods (where water depth to the RPV flange is not of concern) are covered by LCO 3.9.7, "RPV Water Level - New Fuel or Control Rods."] Requirements for fuel handling accidents in the spent fuel storage pool are covered by LCO 3.7.7, "Fuel Pool Water Level."

----------REVIEWER'S NOTE----------

LCO 3.9.6 is written to cover new fuel and control rods as well as irradiated fuel. If a plant adopts LCO 3.9.7, however, the second bracketed portion of this Applicability is adopted in lieu of the first bracketed portion. Additional modifications would also be made to the title and Required Action A.1.

---

ACTIONS

A.1

If the water level is < [22 ft 8 inches] above the top of the RPV flange, all operations involving movement of [irradiated] fuel assemblies [and handling of control rods] within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of [irradiated] fuel movement [and control rod handling] shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of [22 ft 8 inches] above the top of the RPV flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely. Insert 2

[ 3.9 REFUELING OPERATIONS

3.9.7 [Reactor Pressure Vessel (RPV)] Water Level - New Fuel or Control Rods

LCO 3.9.7 [RPV] water level shall be ≥ [22 ft 8 inches] above the top of irradiated fuel assemblies seated within the [RPV].

APPLICABILITY: During movement of new fuel assemblies or handling of control rods within the [RPV] when irradiated fuel assemblies are seated within the [RPV].

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. [RPV] water level not within limit. | A.1 Suspend movement of fuel assemblies and handling of control rods within the [RPV]. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.7.1 | Verify [RPV] water level is ≥ [22 ft 8 inches] above the top of irradiated fuel assemblies seated within the [RPV]. | [24 hours] Insert 1 |

BASES

APPLICABILITY

LCO 3.9.7 is applicable when moving new fuel assemblies or handling control rods (i.e., movement with other than the normal control rod drive) over irradiated fuel assemblies seated within the RPV. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present within the RPV, 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 storage pool are covered by LCO 3.7.7, "Fuel Pool Water Level." Requirements for handling irradiated fuel over the RPV are covered by LCO 3.9.6, "[Reactor Pressure Vessel (RPV)] Water Level - [Irradiated Fuel]."

ACTIONS

A.1

If the water level is < [23 ft] above the top of irradiated fuel assemblies seated within the RPV, all operations involving movement of new fuel assemblies and handling of control rods within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of fuel movement and control rod handling shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verification of a minimum water level of [23 ft] above the top of the irradiated fuel assemblies seated within the RPV ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely. Insert 2

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.
2. FSAR, Section [15.7.6].
3. NUREG-0800, Section [15.7.4].
4. NUREG-0831, Supplement 6, Section [16.4.2].
5. 10 CFR 100.11.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.3 Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately |
| | AND | |
| | B.4 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated. | Immediately |
| C. No RHR shutdown cooling subsystem in operation. | C.1 Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br>AND<br>Once per 12 hours thereafter |
| | AND | |
| | C.2 Monitor reactor coolant temperature. | Once per hour |

SURVEILLANCE REQUIREMENTS

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.8.1

This Surveillance demonstrates that the RHR subsystem is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room. Insert 2

REFERENCES

None.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated. | Immediately |
| C. No RHR shutdown cooling subsystem in operation. | C.1 Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br>AND<br>Once per 12 hours thereafter |
| | AND | |
| | C.2 Monitor reactor coolant temperature. | Once per hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.9.1 | Verify one RHR shutdown cooling subsystem is operating. | [12 hours Insert1 |

BASES

ACTIONS (continued)

administrative controls to assure isolation capability) in each associated penetration not isolated that is assumed to be isolated to mitigate radioactivity releases. This may be performed as an administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, a surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

C.1 and C.2

If no RHR shutdown cooling subsystem is in operation, an alternate method of coolant circulation is required to be established within 1 hour. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.

During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR Shutdown Cooling System), the reactor coolant temperature must be periodically monitored to ensure proper function of the alternate method. The once per hour Completion Time is deemed appropriate.

SURVEILLANCE REQUIREMENTS

SR 3.9.9.1

This Surveillance demonstrates that one RHR shutdown cooling subsystem is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room. Insert 2

REFERENCES

None.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.3.2 ----------NOTE---------- Only applicable in MODE 5. ---------- Place the reactor mode switch in the refuel position. | 1 hour |

SURVEILLANCE REQUIREMENTS

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

Insert 1

BASES

ACTIONS (continued)

accordance with Table 1.1-1. A Note is added to Required Action A.3.2 to indicate that this Required Action is not applicable in MODES 3 and 4, since only the shutdown position is allowed in these MODES. The allowed Completion Time of 1 hour for Required Actions A.2, A.3.1, and A.3.2 provides sufficient time to normally insert the control rods and place the reactor mode switch in the required position, based on operating experience, and is acceptable given that all operations that could increase core reactivity have been suspended.

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1 and SR 3.10.2.2

Meeting the requirements of this Special Operations LCO maintains operation consistent with or conservative to operating with the reactor mode switch in the shutdown position (or the refuel position for MODE 5). The functions of the reactor mode switch interlocks that are not in effect, due to the testing in progress, are adequately compensated for by the Special Operations LCO requirements. The administrative controls are to be periodically verified to ensure that the operational requirements continue to be met. The Surveillances performed at the 12 hour and 24 hour Frequencies are intended to provide appropriate assurance that each operating shift is aware of and verify compliance with these Special Operations LCO requirements. Insert 2

REFERENCES

1. FSAR, Section [7.6.1.1].
2. FSAR, Section [15.4.1.1].

SURVEILLANCE REQUIREMENTS (continued)

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

Insert 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

a Note, which clarifies that this SR is not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements, since SR 3.10.3.2 demonstrates that the alternative LCO 3.10.3.d.2 requirements are satisfied. Also, SR 3.10.3.3 verifies that all control rods other than the control rod being withdrawn are fully inserted. The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardware interlocks that preclude additional control rod withdrawals. Insert 2

REFERENCES 1. FSAR, Section [15.4.1.1].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | B.2.2 Initiate action to satisfy the requirements of this LCO. | Immediately |

SURVEILLANCE REQUIREMENTS

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

Insert 1

BASES

ACTIONS (continued)

Required Actions A.2.1 and A.2.2 are specified, based on the assumption that the control rod is being withdrawn. If the control rod is still insertable, actions must be immediately initiated to fully insert all insertable control rods and within 1 hour place the reactor mode switch in the shutdown position. Action must continue until all such control rods are fully inserted. The allowed Completion Time of 1 hour for placing the reactor mode switch in the shutdown position provides sufficient time to normally insert the control rods.

B.1, B.2.1, and B.2.2

If one or more of the requirements of this Special Operations LCO are not met with the affected control rod not insertable, withdrawal of the control rod and removal of the associated CRD must immediately be suspended. If the CRD has been removed, such that the control rod is not insertable, the Required Actions require the most expeditious action be taken to either initiate action to restore the CRD and insert its control rod, or restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.4.1, SR 3.10.4.2, SR 3.10.4.3, and SR 3.10.4.4

The other LCOs made applicable by this Special Operations LCO are required to have their associated Surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed while the scram function for the withdrawn rod is not available, periodic verification is required to ensure that the possibility of criticality remains precluded. Verification that all the other control rods are fully inserted is required to meet the SDM requirements. Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the affected control rod. The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardware interlocks to preclude an additional control rod withdrawal. Insert 2

SR 3.10.4.2 and SR 3.10.4.4 have been modified by Notes, which clarify that these SRs are not required to be met if the alternative requirements demonstrated by SR 3.10.4.1 are satisfied.

REFERENCES

1. FSAR, Section [15.4.1.1].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.2.2 Initiate action to satisfy the requirements of this LCO. | Immediately |

SURVEILLANCE REQUIREMENTS

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

Insert 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.5.1, SR 3.10.5.2, SR 3.10.5.3, SR 3.10.5.4, and SR 3.10.5.5

Verification that all the control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted is required to ensure the SDM is within limits. Verification that the local five by five array of control rods other than the control rod withdrawn for the removal of the associated CRD, is inserted and disarmed, while the scram function for the withdrawn rod is not available, is required to ensure that the possibility of criticality remains precluded. Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the withdrawn control rod. The Surveillance for LCO 3.1.1, which is made applicable by this Special Operations LCO, is required in order to establish that this Special Operations LCO is being met. Verification that no other CORE ALTERATIONS are being made is required to ensure the assumptions of the safety analysis are satisfied.

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. The 24 hour Frequency is acceptable, given the administrative controls on control rod removal and hardware interlocks to block an additional control rod withdrawal. Insert 2

REFERENCES

1. FSAR, Section [15.4.1.1].

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| | A.3.2 Initiate action to satisfy the requirements of this LCO. | Immediately |

SURVEILLANCE REQUIREMENTS

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

INSERT 1

BASES

ACTIONS (continued)

Completion Times for Required Action A.1, Required Action A.2.1, and Required Action A.2.2 are intended to require that these Required Actions be implemented in a very short time and carried through in an expeditious manner to either initiate action to restore the affected CRDs and insert their control rods, or initiate action to restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.6.1, SR 3.10.6.2, and SR 3.10.6.3

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. The 24 hour Frequency is acceptable, given the administrative controls on fuel assembly and control rod removal, and takes into account other indications of control rod status available in the control room.

INSERT 2

REFERENCES

1. FSAR, Section [15.4.1.1].

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.8.3 | ----------NOTE----------<br>Not required to be met if SR 3.10.8.2 satisfied.<br>----------<br><br>Verify movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff. | During control rod movement |
| SR 3.10.8.4 | Verify no other CORE ALTERATIONS are in progress. | 12 hours |
| SR 3.10.8.5 | Verify each withdrawn control rod does not go to the withdrawn overtravel position. | Each time the control rod is withdrawn to "full out" position<br><br>AND<br><br>Prior to satisfying LCO 3.10.8.c requirement after work on control rod or CRD System that could affect coupling |
| SR 3.10.8.6 | Verify CRD charging water header pressure ≥ 1520 psig. | 7 days |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.8.4

Periodic verification of the administrative controls established by this LCO will ensure that the reactor is operated within the bounds of the safety analysis. The 12 hour Frequency is intended to provide appropriate assurance that each operating shift is aware of and verifies compliance with these Special Operations LCO requirements.

SR 3.10.8.5

Coupling verification is performed to ensure the control rod is connected to the control rod drive mechanism and will perform its intended function when necessary. The verification is required to be performed any time a control rod is withdrawn to the "full out" notch position or prior to declaring the control rod OPERABLE after work on the control rod or CRD System that could affect coupling. This Frequency is acceptable, considering the low probability that a control rod will become uncoupled when it is not being moved as well as operating experience related to uncoupling events.

INSERT 2

SR 3.10.8.6

CRD charging water header pressure verification is performed to ensure the motive force is available to scram the control rods in the event of a scram signal. A minimum accumulator pressure is specified, below which the capability of the accumulator to perform its intended function becomes degraded and the accumulator is considered inoperable. The minimum accumulator pressure of 1520 psig is well below the expected pressure of 1750 psig to 2000 psig. The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.

REFERENCES

1. NEDE-24011-P-A-US, General Electric Standard Application for Reactor Fuel, Supplement For United States (as amended).

2. Letter, T.A. Pickens (BWROG) to G.C. Lainas (NRC), "Amendment 17 to General Electric Licensing Topical Report NEDE-24011-P-A," August 15, 1986.

## 3.10 SPECIAL OPERATIONS

### 3.10.9 Recirculation Loops - Testing

LCO 3.10.9 The requirements of LCO 3.4.1, "Recirculation Loops Operating," may be suspended for ≤ 24 hours to allow:

a. PHYSICS TESTS, provided THERMAL POWER is ≤ [5]% RTP and

b. Performance of the Startup Test Program.

APPLICABILITY: MODES 1 and 2 with less than two recirculation loops in operation.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Requirements of LCO 3.4.1 not met for > 24 hours. | A.1 Insert all insertable control rods. | [1] hour |
| B. Requirements of the LCO not met for reasons other than Condition A. | B.1 Place the reactor mode switch in the shutdown position. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.9.1 | Verify LCO 3.4.1 requirements suspended for ≤ 24 hours. | [1 hour |
| SR 3.10.9.2 | Verify THERMAL POWER is ≤ [5]% RTP during PHYSICS TESTS. | [1 hour |

INSERT 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.9.1 and SR 3.10.9.2

Periodic verification of the administrative controls established by this LCO will ensure that the reactor is operated within the bounds of this LCO. Because the 1 hour Frequency provides frequent checks of the LCO requirements during the allowed 24 hour testing interval, the probability of operation outside the limits concurrent with a postulated accident is reduced even further. INSERT 2

REFERENCES

1. FSAR, Chapter [14].
2. 10 CFR 50.59.
3. FSAR, Section [6.3.3.4].
4. FSAR, Section [ ].

## 3.10 SPECIAL OPERATIONS

### 3.10.10 Training Startups

LCO 3.10.10 The low pressure coolant injection (LPCI) OPERABILITY requirements specified in LCO 3.5.1, "ECCS - Operating," may be changed to allow one residual heat removal subsystem to be aligned in the shutdown cooling mode for training startups, provided the following requirements are met:

a. All OPERABLE intermediate range monitor (IRM) channels are ≤ [25/40] divisions of full scale on Range 7 and

b. Average reactor coolant temperature is < 200°F.

APPLICABILITY: MODE 2 with one LPCI subsystem suction valve closed.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more of the above requirements not met. | A.1 Place the reactor mode switch in the shutdown position. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.10.1 | Verify all OPERABLE IRM channels are ≤ [25/40] divisions of full scale on Range 7. | [1 hour |
| SR 3.10.10.2 | Verify average reactor coolant temperature is < 200°F. | [1 hour |

Insert 1

BASES

| | |
|---|---|
| LCO | As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Training startups may be performed while in MODE 2 with no RHR subsystems aligned in the shutdown cooling mode and, therefore, without meeting this Special Operations LCO or its ACTIONS. However, to minimize the discharge of reactor coolant to the radioactive waste disposal system, performance of the training startups may be performed with one RHR subsystem aligned in the shutdown cooling mode to maintain reactor coolant temperature < 200°F. Under these conditions, the THERMAL POWER must be maintained ≤ 1% RTP (equivalent to all OPERABLE IRM channels ≤ 25/40 divisions of full scale on Range 7) and the reactor coolant temperature must be ≤ 200°F. This Special Operations LCO then allows changing the LPCI OPERABILITY requirements. In addition to the requirements of this LCO, the normally required MODE 2 applicable LCOs must also be met. |
| APPLICABILITY | Training startups while in MODE 2 may be performed with one RHR subsystem aligned in the shutdown cooling mode to control the reactor coolant temperature. Additional requirements during these tests to restrict the reactor power and reactor coolant temperature provide protection against potential conditions that could require operation of both RHR subsystems in the LPCI mode of operation. Operations in all other MODES are unaffected by this LCO. |
| ACTIONS | A.1<br><br>With one or more of the requirements of this LCO not met, (i.e., any OPERABLE IRM channel > 25/40 division of full scale on Range 7, or average reactor coolant temperature ≥ 200°F) the reactor may be in a condition that requires the full complement of ECCS subsystems, and the reactor mode switch must be immediately placed in the shutdown position. This results in a condition that does not require all RHR subsystems to be OPERABLE in the LPCI mode of operation. This action may restore compliance with the requirements of this Special Operations LCO or may result in placing the plant in either MODE 3 or MODE 4. |
| SURVEILLANCE REQUIREMENTS | SR 3.10.10.1 and SR 3.10.10.2<br><br>Periodic verification that the THERMAL POWER and reactor coolant temperature limits of this Special Operations LCO are satisfied will ensure that the stored energy in the reactor core and reactor coolant are sufficiently low to preclude the need for all RHR subsystems to be aligned in the LPCI mode of operation. The 1 hour Frequency provides frequent checks of these LCO requirements during the training startup. Insert 2 |
| REFERENCES | 1. FSAR, Section [6.3.3.4]. |

5.5 Programs and Manuals

5.5.13 Primary Containment Leakage Rate Testing Program (continued)

f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.14 Battery Monitoring and Maintenance Program

This Program provides for battery restoration and maintenance, based on [the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer] of the following:

a. Actions to restore battery cells with float voltage < [2.13] V, and

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.

Insert 3