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February 15, 2010

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (Adoption of TSTF-425, Revision 3)

References:

1. Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," dated April 2007

2. Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) Change TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b," dated March 18, 2009 (ADAMS Accession No. ML090850642)

3. "Notice of Availability of Technical Specification Improvement To Relocate Surveillance Frequencies to Licensee Control—Risk-Informed Technical Specification Task Force (RITSTF) Initiative 5b, Technical Specification Task Force—425, Revision 3," Federal Register published July 6, 2009 (74 FR 31996)

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests an amendment to Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. The proposed amendment would modify the CPS Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04-10 (i.e., Reference 1).

The changes are consistent with NRC-approved Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) change TSTF-425, Revision 3, (i.e., Reference 2); however, EGC is proposing certain variations and deviations from TSTF-425 as discussed in Attachment 1. The Federal Register notice published on July 6, 2009 (i.e., Reference 3),

announced the availability of this TS improvement as part of the Consolidated Line Item Improvement Process (CLIIP).

This request is subdivided as follows.

- Attachment 1 provides a description of the proposed change, the requested confirmation of applicability, and plant-specific verifications.
- Attachment 2 provides documentation of Probabilistic Risk Assessment (PRA) technical adequacy.
- Attachment 3 provides the existing CPS, Unit 1, TS pages marked up to show the proposed changes.
- Attachment 4 provides the proposed CPS, Unit 1, TS Bases changes. The TS Bases pages are provided for information only and do not require NRC approval.
- Attachment 5 provides a TSTF-425 versus CPS TS cross-reference.
- Attachment 6 provides the proposed No Significant Hazards Consideration.

The proposed change has been reviewed by the CPS Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the EGC Quality Assurance Program.

EGC requests approval of the proposed license amendment by February 15, 2011. Once approved, the amendment will be implemented within 120 days. This implementation period will provide adequate time for the affected station documents to be revised using the appropriate change control mechanisms.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the State of Illinois of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Mitchel A. Mathews at (630) 657-2819.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15th day of February 2010.

Respectfully,

Jeffrey L. Hansen
Manager – Licensing and Regulatory Affairs

Attachments:

1. Description and Assessment
2. Documentation of Probabilistic Risk Assessment Technical Adequacy
3. Markup of Proposed Technical Specifications Pages
4. Markup of Proposed Technical Specification Bases Pages
5. TSTF-425 vs. CPS Cross-Reference
6. Proposed No Significant Hazards Consideration

cc: NRC Regional Administrator, Region III with attachments
NRC Senior Resident Inspector – Clinton Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

1.0 DESCRIPTION

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## 1.0 DESCRIPTION

The proposed amendment would modify the Clinton Power Station (CPS), Unit 1, Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the adoption of Technical Specification Task Force (TSTF)-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b." Additionally, the change would add a new program, the Surveillance Frequency Control Program, to TS Section 5.0, "Administrative Controls."

The changes are consistent with NRC-approved TSTF Standard Technical Specifications (STS) change TSTF-425, Revision 3 (i.e., Reference 1); however, Exelon Generation Company, LLC (EGC) is proposing certain variations and deviations from TSTF-425 as discussed below in Section 2.2. The Federal Register notice published on July 6, 2009 (i.e., Reference 2), announced the availability of this TS improvement as part of the Consolidated Line Item Improvement Process (CLIIP).

## 2.0 ASSESSMENT

### 2.1 Applicability of Published Safety Evaluation

EGC has reviewed the model safety evaluation in Reference 2. This review included a review of the NRC's evaluation, TSTF-425, Revision 3, and the requirements specified in Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," Revision 1 (i.e., Reference 3).

Attachment 2 includes EGC's documentation with regard to probabilistic risk assessment (PRA) technical adequacy, consistent with the requirements of Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 1 (i.e., Reference 4), Section 4.2, and describes any PRA models without NRC-endorsed standards, including documentation of the quality characteristics of those models in accordance with RG 1.200.

EGC has concluded that the justifications presented in the TSTF proposal and the model safety evaluation prepared by the NRC are applicable to CPS, Unit 1, and justify this amendment to incorporate the changes to the CPS TS.

### 2.2 Optional Changes and Variations

The proposed amendment is consistent with the STS changes described in TSTF-425, Revision 3; however, EGC proposes variations or deviations from TSTF-425, as identified below.

1. Revised (clean) TS pages are not included in this amendment request given the number of TS pages affected, the straightforward nature of the proposed changes, and outstanding CPS amendment requests that will impact some of the same TS pages. Providing only mark-ups of the proposed TS changes satisfies the requirements of 10 CFR 50.90 in that the mark-ups fully describe the changes desired. This is an

administrative deviation from the NRC's model application dated July 6, 2009, (74 FR 31996) with no impact on the NRC's model safety evaluation published in the same Federal Register notice. As a result of this deviation, the contents and numbering of the attachments for this amendment request differ from the attachments specified in the NRC's model application. Mark-ups of the proposed TS changes are provided in Attachment 3 for CPS, Unit 1. Additionally, mark-ups of the proposed changes to TS Bases pages are provided in Attachment 4 for CPS, Unit 1. The proposed changes to the TS Bases are provided for information only. Changes to the Bases will be incorporated in accordance with the TS Bases Control Program and, therefore, do not require NRC approval.

2. The definition of STAGGERED TEST BASIS is being retained in CPS TS Definition Section 1.1 because this terminology is mentioned in Administrative TS Section 5.5.15, "Control Room Envelope Habitability Program," which is not the subject of this amendment request and is not proposed to be changed. This is an administrative deviation from TSTF-425 with no impact on the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996).

3. The insert provided in TSTF-425 to replace text describing the basis for each Frequency relocated to the Surveillance Frequency Control Program has been revised from, "The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program," to read "The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program." This deviation is necessary to reflect the CPS basis for frequencies which do not, in all cases, base Frequency on operating experience, equipment reliability, and plant risk.

4. Attachment 5 provides a cross-reference between the NUREG-1434 Surveillance Requirements (SRs) included in TSTF-425 versus the CPS SRs included in this amendment request. Attachment 5 includes a summary description of the referenced TSTF-425/CPS TS SRs which is provided for information purposes only and is not intended to be a verbatim description of the TS SRs. This cross-reference highlights the following:

    a. NUREG-1434 SRs included in TSTF-425 and corresponding CPS SRs with identical SR numbers,

    b. NUREG-1434 SRs included in TSTF-425 and corresponding CPS SRs with differing SR numbers,

    c. NUREG-1434 SRs included in TSTF-425 that are not contained in the CPS TS, and

    d. CPS plant-specific SRs that are not contained in NUREG-1434; and therefore, not included in the TSTF-425 mark-ups.

    Concerning the above, CPS SRs that have SR numbers identical to the corresponding NUREG-1434 SRs are not deviations from TSTF-425.

CPS SRs with SR numbers that differ from the corresponding NUREG-1434 SRs are administrative deviations from TSTF-425 with no impact on the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996).

For NUREG-1434 SRs that are not contained in the CPS TS, the corresponding mark-ups included in TSTF-425 for these SRs are not applicable to CPS. This is an administrative deviation from TSTF-425 with no impact on the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996).

For CPS plant-specific SRs that are not contained in NUREG-1434; and therefore, not included in the NUREG-1434 mark-ups provided in TSTF-425, EGC has determined that the relocation of the Frequencies for these CPS plant-specific SRs is consistent with the intent of TSTF-425, Revision 3, and with the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996), including the scope exclusions identified in Section 1.0, "Introduction," of the model safety evaluation, because the subject plant-specific SRs involve fixed periodic Frequencies. In accordance with TSTF-425, changes to the Frequencies for these SRs would be controlled under the Surveillance Frequency Control Program. The Surveillance Frequency Control Program provides the necessary administrative controls to require that SRs related to testing, calibration and inspection are conducted at a frequency 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. Changes to Frequencies in the Surveillance Frequency Control Program would be evaluated using the methodology and probabilistic risk guidelines contained in Reference 3, as approved by NRC letter dated September 19, 2007 (ADAMS Accession No. ML072570267). The Reference 3 methodology includes qualitative considerations, risk analyses, sensitivity studies and bounding analyses, as necessary, and recommended monitoring of the performance of structures, systems, and components (SSCs) for which Frequencies are changed to assure that reduced testing does not adversely impact the SSCs. In addition, the Reference 3 methodology satisfies the five key safety principles specified in Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998 (i.e., Reference 5), relative to changes in SR Frequencies.

## 3.0 REGULATORY ANALYSIS

### 3.1 No Significant Hazards Consideration

EGC has reviewed the proposed no significant hazards consideration (NSHC) determination published in the Federal Register dated July 6, 2009 (74 FR 31996). EGC has concluded that the proposed NSHC presented in the Federal Register notice is applicable to CPS, Unit 1, and is provided as Attachment 6 to this amendment request, which satisfies the requirements of 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a).

### 3.2 Applicable Regulatory Requirements

A description of the proposed changes and their relationship to applicable regulatory requirements is provided in TSTF-425, Revision 3 (i.e., Reference 1) and the NRC's model safety evaluation published in the Notice of Availability dated July 6, 2009 (i.e., Reference 2). EGC has

concluded that the relationship of the proposed changes to the applicable regulatory requirements presented in the Federal Register notice is applicable to CPS, Unit 1.

3.3 Conclusions

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

## 4.0 ENVIRONMENTAL CONSIDERATION

EGC has reviewed the environmental consideration included in the NRC's model safety evaluation published in the Federal Register on July 6, 2009 (i.e., Reference 2). EGC has concluded that the NRC's findings presented therein are applicable to CPS, Unit 1, and the determination is hereby incorporated by reference for this application.

## 5.0 REFERENCES

1. TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b," dated March 18, 2009

2. "Notice of Availability of Technical Specification Improvement To Relocate Surveillance Frequencies to Licensee Control—Risk-Informed Technical Specification Task Force (RITSTF) Initiative 5b, Technical Specification Task Force-425, Revision 3," Federal Register published July 6, 2009 (74 FR 31996)

3. Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," dated April 2007 (ADAMS Accession Number: ML071360456)

4. Regulatory Guide 1.200, Revision 1, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," dated January 2007 of Probabilistic Risk Assessment Results for Risk-Informed Activities," January 2007 (ADAMS Accession Number: ML070240001)

5. Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998 (ADAMS Accession No. ML003740176)

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## A.1 Overview

The implementation of the Surveillance Frequency Control Program (also referred to as Tech Spec Initiative 5b) at Clinton Power Station (CPS) will follow the guidance provided in Nuclear Energy Institute (NEI) 04-10, Revision 1 (i.e., Reference 1) in evaluating proposed surveillance test interval (STI) changes.

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

- Each STI revision is reviewed to determine whether there are any commitments made to the NRC that may prohibit changing the interval. If there are no related commitments, or the commitments may be changed using a commitment change process based on NRC endorsed guidance, then evaluation of the STI revision would proceed. If a commitment exists and the commitment change process does not permit the change, then the STI revision would not be implemented.
- A qualitative analysis is performed for each STI revision that involves several considerations as explained in Reference 1.
- Each STI revision is reviewed by an Expert Panel, referred to as the Integrated Decision-making Panel (IDP), which is normally the same panel as is used for Maintenance Rule implementation, but with the addition of specialists with experience in surveillance tests and system or component reliability. If the IDP approves the STI revision, the change is implemented and documented for future audits by the NRC. If the IDP does not approve the STI revision, the STI value is left unchanged.
- Performance monitoring is conducted as recommended by the IDP. In some cases, no additional monitoring may be necessary beyond that already conducted under the Maintenance Rule. The performance monitoring helps to confirm that no failure mechanisms related to the revised test interval become important enough to alter the information provided for the justification of the interval changes.
- The IDP is responsible for periodic review of performance monitoring results. If it is determined that the time interval between successive performances of a surveillance test is a factor in the unsatisfactory performances of the surveillance, the IDP returns the STI back to the previously acceptable STI.
- In addition to the above steps, the Probabilistic Risk Assessment (PRA) is used when possible to quantify the effect of a proposed individual STI revision compared to acceptance criteria in Figure 2 of NEI 04-10. Also, the cumulative impact of all risk-informed STI revisions on all PRAs (i.e., internal events, external events and shutdown) is also compared to the risk acceptance criteria as delineated in NEI 04-10.

For those cases where the STI can not be modeled in the plant PRA (or where a particular PRA model does not exist for a given hazard group), a qualitative or bounding analysis is performed to provide justification for the acceptability of the proposed test interval change.

The NEI 04-10 methodology endorses the guidance provided in Regulatory Guide (RG) 1.200, Revision 1 (i.e., Reference 2), "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," dated January 2007. The guidance in RG-1.200 indicates that the following steps should be followed when performing PRA assessments:

1. Identify the parts of the PRA used to support the application.
    - Structures, systems, and components (SSCs), operational characteristics affected by the application and how these are implemented in the PRA model.
    - A definition of the acceptance criteria used for the application.
2. Identify the scope of risk contributors addressed by the PRA model.
    - If not full scope (i.e., internal and external), identify appropriate compensatory measures or provide bounding arguments to address the risk contributors not addressed by the model.
3. Summarize the risk assessment methodology used to assess the risk of the application.
    - Include how the PRA model was modified to appropriately model the risk impact of the change request.
4. Demonstrate the Technical Adequacy of the PRA.
    - Identify plant changes (design or operational practices) that have been incorporated at the site, but are not yet in the PRA model and justify why the change does not impact the PRA results used to support the application.
    - Document peer review findings and observations that are applicable to the parts of the PRA required for the application, and for those that have not yet been addressed justify why the significant contributors would not be impacted.
    - Document that the parts of the PRA used in the decision are consistent with applicable standards endorsed by the RG 1.200 (currently, this is just the internal events PRA standard). Provide justification to show that where specific requirements in the standard are not adequately met, it will not unduly impact the results.
    - Identify key assumptions and approximations relevant to the results used in the decision-making process.

Because of the broad scope of potential Initiative 5b applications and the fact that the impact of such assumptions differs from application to application, each of the issues encompassed in Items 1 through 3 will be covered with the preparation of each individual PRA assessment made in support of the individual STI interval requests. The purpose of the remaining portion of this appendix is to address the requirements identified in item 4 above.

## A.2 Technical Adequacy of the PRA Model

The 2006C update to the CPS PRA model is the most recent evaluation of the risk profile at CPS for internal event challenges (i.e., Reference 3). The CPS PRA modeling is highly detailed, including a wide variety of initiating events, modeled systems, operator actions, and

common cause events. The PRA model quantification process used for the CPS PRA is based on the event tree / fault tree methodology, which is a well-known methodology in the industry.

Exelon Generation Company, LLC (EGC) employs a multi-faceted approach to establishing and maintaining the technical adequacy and plant fidelity of the PRA models for all operating EGC nuclear generation sites. This approach includes both a proceduralized PRA maintenance and update process, and the use of self-assessments and independent peer reviews. The following information describes this approach as it applies to the CPS PRA.

PRA Maintenance and Update

The EGC risk management process ensures that the applicable PRA model remains an accurate reflection of the as-built and as-operated plants. This process is defined in the EGC Risk Management program, which consists of a governing procedure (ER-AA-600, "Risk Management") and subordinate implementation procedures. EGC procedure ER-AA-600-1015, "FPIE PRA Model Update" delineates the responsibilities and guidelines for updating the full power internal events PRA models at all operating EGC nuclear generation sites. The overall EGC Risk Management program, including ER-AA-600-1015, defines the process for implementing regularly scheduled and interim PRA model updates, for tracking issues identified as potentially affecting the PRA models (e.g., due to changes in the plant, errors or limitations identified in the model, industry operating experience), and for controlling the model and associated computer files. To ensure that the current PRA model remains an accurate reflection of the as-built, as-operated plants, the following activities are routinely performed:

- Design changes and procedure changes are reviewed for their impact on the PRA model.
- New engineering calculations and revisions to existing calculations are reviewed for their impact on the PRA model.
- Maintenance unavailabilities are captured, and their impact on CDF is trended.
- Plant specific initiating event frequencies, failure rates, and maintenance unavailabilities are updated approximately every four years.

In addition to these activities, EGC risk management procedures provide the guidance for particular risk management and PRA quality and maintenance activities. This guidance includes:

- Documentation of the PRA model, PRA products, and bases documents.
- The approach for controlling electronic storage of Risk Management (RM) products including PRA update information, PRA models, and PRA applications.
- Guidelines for updating the full power, internal events PRA models for EGC nuclear generation sites.
- Guidance for use of quantitative and qualitative risk models in support of the On-Line Work Control Process Program for risk evaluations for maintenance tasks (corrective maintenance, preventive maintenance, minor maintenance, surveillance tests and modifications) on systems, structures, and components (SSCs) within the scope of the Maintenance Rule (10CFR50.65 (a)(4)).

In accordance with this guidance, regularly scheduled PRA model updates nominally occur on an approximately four year cycle; shorter intervals may be required if plant changes, procedure enhancements, or model changes result in significant risk metric changes. In addition, EGC now maintains a continuous updated model to ensure the risk assessment of the as-built, as-operated plant does not deviate significantly from the model of record.

As indicated previously, RG 1.200 also requires that additional information be provided as part of the license amendment request (LAR) submittal to demonstrate the technical adequacy of the PRA model used for the risk assessment. Each of these items (plant changes not yet incorporated in to the PRA model, relevant peer review findings, consistency with applicable PRA Standards, and the identification of key assumptions) will be discussed in turn.

### *A.2.1 Plant Changes Not Yet Incorporated into the PRA Model*

A PRA updating requirements evaluation (URE - EGC PRA model update tracking database) is created for all issues that are identified that could impact the PRA model. The URE database includes the identification of those plant changes that could impact the PRA model.

As part of the PRA evaluation for each STI change request, a review of open items in the URE database for CPS will be performed and an assessment of the impact on the results of the application will be made prior to presenting the results of the risk analysis to the IDP. If a non-trivial impact is expected, then this may include the performance of additional sensitivity studies or model changes to confirm the impact on the risk analysis.

### *A.2.2 Applicability of Peer Review Findings and Observations*

Several assessments of technical capability have been made, and continue to be planned, for the CPS PRA model. These assessments are as follows and further discussed in the paragraphs below.

- An independent PRA peer review was conducted under the auspices of the BWR Owners Group in October 2000, following the Industry PRA Peer Review process (i.e., Reference 3). This peer review included an assessment of the PRA model maintenance and update process.
- A self-assessment analysis was performed in 2005 against Addenda A of the ASME PRA Standard (ASME RA-Sa-2003, (i.e., Reference 4)) and the draft Revision 1 of RG 1.200 (DG-1161) (i.e., Reference 5).
- During 2005 and 2006 the CPS PRA model results were evaluated in the BWR Owners Group PRA cross-comparisons study performed in support of implementation of the mitigating systems performance indicator (MSPI) process.
- In 2009, an update of the self-assessment analysis was performed against ASME PRA Standard, Addendum B (i.e., Reference 4), and the criteria in RG 1.200, Rev. 1 (i.e., Reference 2).
- An industry peer review of the CPS PRA model occurred in October 2009. The final report for this review has not been received by EGC.

A summary of the disposition of the BWROG PRA Peer Review facts and observations (F&Os) for the CPS PRA models was documented as part of the statement of PRA capability for MSPI

in the CPS MSPI basis document (i.e., Reference 6). All of the significance level "A" F&Os have been resolved and 89 of the 92 significance level "B" F&Os had been resolved as documented in the MSPI basis document. One additional level "B" F&O has since been resolved. The remaining 2 open significance level "B" F&Os are listed in Table A.2-1.

A Self-Assessment of the 2003 CPS PRA was performed in support of the CPS 2006 PRA Update. This Gap Analysis was performed using Addenda A of the ASME PRA Standard (ASME RA-Sa-2003) and the draft Revision 1 of RG 1.200 (DG-1161). Potential gaps to Capability Category II of the Standard were identified and used to plan the CPS 2006 PRA Update.

A recent Self-Assessment of the 2006C PRA has been performed in support of the industry peer review of the CPS PRA that occurred in the fourth quarter of 2009. This was a self-assessment of the PRA capability of the model relative to the updated requirements in Addendum B of the ASME PRA Standard (i.e., Reference 4) and criteria in RG 1.200, Revision 1 (i.e., Reference 2), including the NRC positions stated in RG 1.200, Appendix A, and the clarifications in (i.e., Reference 7).

### *A.2.3 Consistency with Applicable PRA Standards*

As indicated above, a recent self assessment of the 2006C CPS PRA was performed against the ASME PRA standard. A summary of the open gaps from this assessment and their impact relative to the application is provided in attached Table A.2-2.

All remaining gaps will be reviewed for consideration during the next PRA model update but are judged to have low impact on the PRA model or its ability to support a full range of PRA applications. The remaining gaps are documented in the URE database so that they can be tracked and their potential impacts accounted for in applications where appropriate.

Each item will be reviewed as part of each STI change assessment that is performed and an assessment of the impact on the results of the application will be made prior to presenting the results of the risk analysis to the IDP. If a non-trivial impact is expected, then this may include the performance of additional sensitivity studies or model changes to confirm the impact on the risk analysis.

**Table A.2-1**

**IMPACT OF OPEN SIGNIFICANT PRA PEER REVIEW FINDINGS FOR THE CLINTON POWER STATION PRA MODEL**

| Peer Review Element | FACTS & OBSERVATIONS (F&Os) | | | Impact Assessment |
|---|---|---|---|---|
| | ID | Priority | Summary | |
| TH-8 | TH-8-1 | B | Additional plant specific room heat-up calculations (or enhancements to existing calculations) should be performed to support modeling assumptions regarding room-cooling requirements. Areas specifically identified are Control Room, Reactor Core Isolation Cooling (RCIC), Low Pressure Core Spray, Low Pressure Coolant Injection, and Switchgear rooms. | Non-Significant Impact: Primarily a documentation issue. The PRA already makes appropriate assumptions regarding the need for room cooling in the appropriate areas. |
| HR-6 | HR-6-1 | B | All pre-initiator Human Error Probabilities (HEPs) in the CPS PSA model are based on screening estimates. For post-initiator screening HEPs with RAWs greater than 1.1, the HEPs were re-evaluated with more detailed calculations. For consistency sake, the pre-initiator HEP calculations should follow the same approach. | Non-significant impact: Pre-initiator HEPs contribute approximately 2% of CDF. Detailed evaluation of the HEPs for pre-initiators would be expected to reduce the relative importance of these events further. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 1 | Review initiating event precursors in identifying the initiating events to be modeled.<br><br>A rigorous explicit assessment of all the events in NUREG-1275 has not been performed. | IE-A7 | Open: Explicit analysis of event precursors is judged not to provide significant insights to the CPS IE analysis, which includes initiating events known to be relevant to BWR-6 plants in general and CPS in particular. This type of activity is known to have been performed for another BWR plant (review of hundreds of events INPO SENs, SOERs, SERs, and NRC SECY letters on precursors) and no new initiating events were identified. It is expected that future industry studies will provide this generic assessment. | No Impact: Documentation item. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 2 | Assumptions regarding loss of switchgear room cooling should be supported by room cooling calculation. | IE-C4<br>AS-B3<br>SC-B2<br>SC-C1<br>SY-A17<br>SY-A19<br>SY-A20<br>SY-B7<br>SY-B8 | Open: Room cooling calculations have not been performed at this time and are being considered in the next update. | Non-Significant Impact: The PRA already makes appropriate assumptions regarding the need for room cooling and explicitly models room cooling in certain areas. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 3 | The following should be considered in the pre-initiator HEP evaluation:<br>1) A list of the PRA systems to consider for test and maintenance actions<br>2) Rules for identifying and screening test and maintenance actions from the PRA<br>3) A list of procedures reviewed, the potential test and maintenance actions associated with the procedures, and the disposition of the action (screened or evaluated).<br>4) Identify T&M activities that require realignment of the system outside its normal operational or stand by status. | HR-A1, HR-A2, HR-A3, HR-C2, HR-C3 | Open: The current methodology and documentation for identifying pre-initiator HEPs is judged adequate. Any additional documentation to conform to inferred requirements of pre-initiator identification Supporting Requirements would be documentation enhancement and not result in increasing the number of pre-initiator HEPs included in the model. Other BWRs that have attempted to rigorously follow these pre-initiator HEP Supporting Requirements have resulted in explicitly modeling significantly less pre-initiator HEPs in the model. | No Impact: This is primarily a Documentation item. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 4 | Pre-initiator HEPs in the CPS PRA model are based on screening estimates (URE 2001-084, peer review F&O HR-6-1), should not use screening values for dominant pre-initiator HEPs. | HR-B1, HR-B2, HR-D1, HR-D2, HR-D3, HR-D4 | Open: Future updates of the CPS PRA will consider explicit/specific pre-initiator HEP calculations. The current calculations are based on representative procedures/practices for similar pre-initiator HEPs. The current estimates are generally higher error probabilities than would be obtained if various explicit recovery factors and testing frequencies were applied in specific HEP calculations for each pre-initiator. The impact on the model is non-significant, pre-initiator HEPs contribute approximately 2% to the CL06C CDF. | Non-significant impact: Pre-initiator HEPs contribute approximately 2% of CDF). Detailed evaluation of the HEPs for pre-initiators would be expected to reduce the relative importance of these events further. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 5 | Failure data development using surveillance test data should fulfill the requirements of DA-C10, and should be documented appropriately. Review surveillance test procedures and identify all failure modes that are fully tested by the procedures. Include data for the failure modes that are fully tested. The results of unplanned demands on equipment should also be accounted for. | DA-C10 | Open: The maintenance rule data is used directly, but a confirmation that the data are collected exactly consistent with the requirements in the Standard has not been performed | Non-significant impact: Any adjustment to failure data counts resulting from a rigorous review of testing procedures is judged to have a non-significant impact on CDF and LERF values. This is judged to have a minimal impact on the failure rate used in the model.<br>Not significant. The model is reasonably consistent with data from the plant MR database, which is adequate for future applications. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 6 | As needed in maintenance unavailability determination, perform interviews of maintenance staff for equipment with incomplete or limited maintenance information and document appropriately. | DA-C12 | Open: Future updates of the CPS PRA may consider performance of interviews of plant personnel to supplement maintenance unavailability estimates for equipment with limited maintenance information. | Non-significant impact: Any refinements to maintenance unavailabilities are judged to result in a negligible impact on CDF (i.e., the dominant maintenance terms with respect to CDF are trains with good maintenance information - ECCS trains, RCIC, EDGs, SX). The model is reasonably consistent with data from the plant MR database, which is adequate for future applications. |
| 7 | The CPS internal flooding analysis and documentation should be updated to meet ASME Standard expectations. | SC-A6, SY-A4, IF Technical Element | Open: An internal flooding update to the CPS CL06C model has recently been completed and results of the industry peer review are pending. | Potential impact: Internal flooding analyses have varied impacts on applications. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 8 | Document significant basic events that contribute to the significant initiating events whose frequencies are quantified using fault tree methods. | QU-D5a | Open: Initiating event fault trees are not linked into the accident sequence models. Documentation of the importance of failures in initiating event fault trees in the base PRA notebooks is a documentation enhancement. | No Impact: Documentation item. |
| 9 | The following enhancements to the documentation of the CPS PRA should be considered to comply with the documentation requirements in the Standard:<br>• Provide a list of human actions and equipment failures (significant basic events) that cause accidents to be non-dominant.<br>• Bases for the elimination of mutually exclusive events from the model need to be added.<br>Include cutsets segregated by accident sequence in the documentation. | QU-F2 | Open: These recommendations are documentation enhancements for the base PRA and are maintained for consideration for future PRA updates. | No Impact: Documentation item. |

**TABLE A.2-2 – STATUS OF IDENTIFIED GAPS TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD**

| Gap # | Description of Gap | Applicable Supporting Requirements | Current Status / Comment | Importance to Application |
|---|---|---|---|---|
| 10 | The CPS PRA includes CDF and LERF parametric uncertainty analysis; as well as modeling uncertainty analysis and associated sensitivity studies. However the approach used in the CPS PRA pre-dates NUREG-1855 (the currently preferred process by peer review teams for approaching modeling uncertainty). | QU-E1<br>QU-E2<br>QU-E4<br>QU-F4<br>IE-D3<br>AS-C3<br>SC-C3<br>SY-C3<br>HR-I3<br>DA-E3<br>IF-F3<br>LE-G4 | The CPS PRA includes CDF and LERF parametric uncertainty analysis and modeling uncertainty analysis.<br><br>The existing CPS PRA modeling uncertainty discussions are significant (well over 100 pages of discussions and include many quantitative sensitivity studies).<br>This observation is one of current industry process preference. Based on other Exelon PRAs that have recently transitioned to use of this latest process, moving to NUREG-1855 may actually substantially reduce the level of discussion and sensitivity analyses in the CPS PRA uncertainty analysis, not increase it. | This observation does not impact the CPS base PRA models and results. Sensitivity and uncertainty analysis appropriate to future CPS individual 5b risk applications will be performed (using the appropriate industry guidelines and expectations). |

### *A.2.4 Identification of Key Assumptions*

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

The results of the standby failure rate sensitivity study plus the results of any additional sensitivity studies identified during the performance of the reviews as outlined in A.2.1 and A.2.3 above (including a review of identified sources of uncertainty that were developed for CPS based on the EPRI Technical Report (TR) 1009652 guidance (i.e., Reference 8)) for each STI change assessment will be documented and included in the results of the risk analysis that goes to the IDP.

## A.3 External Events Considerations

External hazards were evaluated in the CPS Individual Plant Examination of External Events (IPEEE) submittal in response to the NRC IPEEE Program (Generic Letter 88-20 Supplement 4). The IPEEE Program was a one-time review of external hazard risk and was limited in its purpose to the identification of potential plant vulnerabilities and the understanding of associated severe accident risks.

The results of the CPS IPEEE study are documented in the CPS IPEEE Main Report (i.e., Reference 9). The primary areas of external event evaluation at CPS were internal fire and seismic. The internal fire events were addressed by using the EPRI "Fire Risk Analysis Implementation Guide," (i.e., Reference 10) and the seismic evaluations were performed in accordance with the EPRI Seismic Margins Analysis (SMA) methodology (i.e., Reference 11). As such, there are no comprehensive CDF and LERF values available from the IPEEE to support the STI risk assessment for seismic issues.

Other external event risks such as severe weather, high winds or tornados, transportation accidents, nearby facility accidents, and other miscellaneous external hazards were also considered in the IPEEE analysis. The CPS site characteristics and design meet all the applicable criteria of the NRC Standard Review Plan (SRP). No significant quantitative contribution from these external events was identified by IPEEE evaluations. The compensatory actions and risk insights in this LAR are also judged applicable to qualitatively reduce the risk associated with these events.

The current CPS Fire PRA (FPRA) is an interim implementation of NUREG/CR-6850 (i.e., Reference 12); that is, not all tasks identified in NUREG/CR-6850 are yet completely addressed or implemented due to the changing state-of-the-art of industry at the time of the 2007-2008 CPS FPRA development.

NUREG/CR-6850 task limitations and other precautions regarding the 2007-2008 FPRA upgrade for CPS are as follows:

1. Multiple Spurious Operation (MSO) Review (NUREG/CR-6850 Task 2) - MSOs are reviewed and considered; however, an expert panel is not used. At the time of the CPS

FPRA development, the BWR Owners' Group was developing a generic list of MSOs to be considered. In future CPS FPRA updates this list will be reviewed and incorporated as necessary.

2. Instrumentation Review (NUREG/CR-6850 Task 2) - The new requirements of NUREG/CR-6850 regarding the explicit identification and modeling of instrumentation required to support PRA credited operator actions is not addressed. The industry treatment for this task is still being developed.
3. The Balance of Plant (BOP) (NUREG/CR-6850 Task 2) - The BOP is not fully treated. BOP support system failure is conservatively assumed. Additional modeling could be conducted to reduce the fire CDF due to this assumption if time and funding is available in future updates.
4. Large Early Release Frequency (LERF) (NUREG/CR-6850 Task 2) - LERF is not considered. LERF is expected to be addressed in future updates.
5. Limited Analysis Iterations (NUREG/CR-6850 Task 9-12) - The process of conducting a FPRA is iterative, identifying conservative assumptions and high risk compartments and performing analyses to refine the assumptions and reduce those compartment risks. The ability to conduct iterations is limited based on resources. The scenarios developed for the 2008 CPS FPRA may benefit from further refinement as necessary for application or for future updates.
6. Multi-Compartment Review (NUREG/CR-6850 Task 11) - This subtask reviews the fire analysis compartment boundaries to ensure they are sufficiently robust to prevent the spread of fire between FPRA analysis compartments or that such propagations are adequately addressed by the developed scenarios. The design and plant layout of CPS make fire propagation to multiple compartments unlikely compared to the fire risk in individual compartments.
7. Seismic Fire Interactions (NUREG/CR-6850 Task 13) - This task reviews previous assessments to identify any specific interaction between suppression system and credited components or adverse impact of fire protection system interactions that should be accounted for in the FPRA.
8. Uncertainty and Sensitivity Analysis (NUREG/CR-6850 Task 15) - This task explores the impacts of possible variation of input parameters used in the development of the model and the inputs to the analysis on the FPRA results. This task is not currently addressed because the industry is still developing an appropriate methodology.

Some limitations of these items are:

- Item 1(MSO) represents a source of additional fire CDF contribution (i.e., if the BWROG MSO list includes MSOs not addressed in this update).
- Item 2 (Instrumentation Review) represents a potential additional fire CDF contribution that cannot be estimated at this time since the methodology is not established.
- Items 3 (BOP) and 8 (Uncertainty) are potential sources of conservatism in the results.
- Item 4 (LERF) is a future scope issue not affecting the fire CDF model.

- Items 5 (Iterations) and 6 (Multi-compartment) represent modeling assumptions that should be reviewed with each FPRA application to determine their applicability and/or potential impact on the decision.
- Item 7 (Seismic) is an FPRA application completeness issue for which the methodology is not yet established.

Given the above, the 2008 CPS FPRA model is judged to provide a meaningful representation of fire CDF contributors, and is appropriate for use in risk-informed decision-making, to the extent that these limitations are recognized and addressed in each application, as appropriate. The model is, however, "interim" due to the stated limitations.

The NEI 04-10 methodology allows for STI change evaluations to be performed in the absence of quantifiable PRA models for all external hazards. For those cases where the STI can not be modeled in the plant PRA (or where a particular PRA model does not exist for a given hazard group), a qualitative or bounding analysis is performed to provide justification for the acceptability of the proposed test interval change.

Therefore, in performing the assessments for the other hazard groups, the qualitative or bounding approach will be utilized in most cases. The fire PRA model will be exercised to obtain quantitative fire risk insights when a qualitative or a bounding analysis is not deemed sufficient, but refinements may be needed on a case-by-case basis. This approach is consistent with the accepted NEI 04-10 methodology (refer to Figure 2 of NEI 04-10).

## A.4 Summary

The CPS PRA maintenance and update processes and technical capability evaluations described above provide a robust basis for concluding that the PRA is suitable for use in risk-informed processes such as that proposed for the implementation of a Surveillance Frequency Control Program. As indicated above, in addition to the standard set of sensitivity studies required per the NEI 04-10 methodology, open items for changes at the site and remaining gaps to specific requirements in the PRA standard will be reviewed to determine which, if any, would merit application-specific sensitivity studies in the presentation of the application results.

## A.5 References

1 NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies, Industry Guidance Document," Revision 1, dated April 2007

2 Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk Informed Activities," Revision 1, dated January 2007

3 NEI 00-02, "Probabilistic Risk Assessment (PRA) Peer Review Process Guidance," Revision A3, dated March 2000

4 American Society of Mechanical Engineers (ASME) RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," Addenda RA-Sa-2003 and Addenda RA-Sb-2005, dated December 2003 and December 2005

5 Draft Regulatory Guide DG-1161 (Proposed Revision 1 of Regulatory Guide 1.200, dated February 2004), "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," dated September 2006

6 "Clinton MSPI Basis Document," Rev. 3, dated December 12, 2008

7 U.S. Nuclear Regulatory Commission Memorandum to Michael T. Lesar from Farouk Eltawila, "Notice of Clarification to Revision 1 of Regulatory Guide 1.200," dated July 27, 2007

8 EPRI Technical Report TR-1009652, "Guidance for the Treatment of Uncertainty in Risk Informed Applications: Technical Basis Document," dated December 2004,

9 "Clinton Power Station Individual Plant Examination for External Events," dated September 1995

10 Electric Power Research Institute (EPR)I Project Report 3385-01, "Fire Risk Analysis Implementation Guide," dated January 1994

11 Electric Power Research Institute EPRI NP-6041, "A Method for Assessment of Nuclear Power Plant Seismic Margin," NTS Engineering, et. al., dated October 1988

12 NUREG/CR-6850 (EPRI TR-1011989), "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, EPRI/NRC-RES," dated September 2005.

**ATTACHMENT 3**
**Markup of Proposed Technical Specifications Pages**

**Clinton Power Station, Unit 1**

**Facility Operating License No. NPF-62**

MARKUP OF PROPOSED TECHNICAL SPECIFICATIONS PAGES

| | | | | |
|---|---|---|---|---|
| 3.1-9 | 3.3-46 | 3.6-15 | 3.7-2 | 3.8-38 |
| 3.1-10 | 3.3-54 | 3.6-16 | 3.7-3 | 3.8-41 |
| 3.1-12 | 3.3-63 | 3.6-18 | 3.7-6 | 3.8-43 |
| 3.1-17 | 3.3-67 | 3.6-19a | 3.7-7 | 3.8-45 |
| 3.1-19 | 3.3-71 | 3.6-20 | 3.7-10 | 3.9-1 |
| 3.1-20 | 3.3-74 | 3.6-21 | 3.7-12 | 3.9-2 |
| 3.1-21 | 3.3-76 | 3.6-23 | 3.7-13 | 3.9-3 |
| 3.1-22 | 3.3-79 | 3.6-25 | 3.7-14 | 3.9-7 |
| 3.1-25 | 3.3-82 | 3.6-27a | 3.8-4 | 3.9-8 |
| 3.2-1 | 3.4-3 | 3.6-30 | 3.8-5 | 3.9-9 |
| 3.2-2 | 3.4-6 | 3.6-31 | 3.8-6 | 3.9-12 |
| 3.2-3 | 3.4-9 | 3.6-33 | 3.8-6a | 3.9-15 |
| 3.3-3 | 3.4-11 | 3.6-35 | 3.8-7 | 3.10-5 |
| 3.3-4 | 3.4-13 | 3.6-39 | 3.8-8 | 3.10-8 |
| 3.3-5 | 3.4-19 | 3.6-40 | 3.8-9 | 3.10-11 |
| 3.3-6 | 3.4-21 | 3.6-42 | 3.8-10 | 3.10-12 |
| 3.3-12 | 3.4-24 | 3.6-44 | 3.8-10a | 3.10-14 |
| 3.3-13 | 3.4-26 | 3.6-45 | 3.8-11 | 3.10-15 |
| 3.3-14b | 3.4-28 | 3.6-50 | 3.8-12 | 3.10-17 |
| 3.3-16 | 3.4-30 | 3.6-53 | 3.8-13 | 3.10-18 |
| 3.3-17 | 3.4-33 | 3.6-54a | 3.8-14 | 3.10-22 |
| 3.3-21 | 3.5-4 | 3.6-54b | 3.8-15 | 3.10-23 |
| 3.3-23 | 3.5-5 | 3.6-60 | 3.8-22 | 3.10-24 |
| 3.3-24 | 3.5-8 | 3.6-64 | 3.8-23 | 3.10-26 |
| 3.3-26 | 3.5-9 | 3.6-65 | 3.8-25 | 5.0-16c |
| 3.3-27 | 3.5-11 | 3.6-66 | 3.8-32 | |
| 3.3-29 | 3.5-12 | 3.6-67 | 3.8-33 | |
| 3.3-38 | 3.6-8 | 3.6-70 | 3.8-35 | |

ACTIONS (Continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Required Action and associated Completion Time of Condition A, C, or D not met.<br><br>OR<br><br>Nine or more control rods inoperable. | E.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.3.1 | Determine the position of each control rod. | ~~24 hours~~ |
| SR 3.1.3.2 | Deleted | |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| 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>Insert each withdrawn control rod at least one notch. | In accordance with the Surveillance Frequency Control Program<br>~~31 days~~ |
| SR 3.1.3.4 | Verify each control rod scram time from fully withdrawn to notch position 13 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 |

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 fuel movement within the reactor pressure vessel<br><br>AND<br><br>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. | ~~200 days cumulative operation in MODE 1~~ |
| SR 3.1.4.3 | Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with any reactor steam dome pressure. | Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect scram time |

(continued)

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. One or more control rod scram accumulators inoperable with reactor steam dome pressure < 600 psig. | C.1 Verify all control rods associated with inoperable accumulators are fully inserted. | Immediately upon discovery of charging water header pressure < 1520 psig |
| | AND | |
| | C.2 Declare the associated control rod inoperable. | 1 hour |
| D. Required Action and associated Completion Time of Required Action B.1 or C.1 not met. | D.1 --------NOTE--------- Not applicable if all inoperable control rod scram accumulators are associated with fully inserted control rods. ---------- Place the reactor mode switch in the shutdown position. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.5.1 | Verify each control rod scram accumulator pressure is ≥ 1520 psig. | ~~7 days~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Nine or more OPERABLE control rods not in compliance with BPWS. | B.1 --------NOTE--------- Affected control rods may be bypassed in RACS in accordance with SR 3.3.2.1.9 for insertion only. ---------- Suspend withdrawal of control rods. | Immediately |
| | AND | |
| | B.2 Replace 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~~ |

In accordance with the Surveillance Frequency Control Program

## 3.1 REACTIVITY CONTROL SYSTEMS

### 3.1.7 Standby Liquid Control (SLC) System

LCO 3.1.7 Two SLC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One SLC subsystem inoperable. | A.1 Restore SLC subsystem to OPERABLE status. | 7 days |
| B. Two SLC subsystems inoperable. | B.1 Restore one SLC 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 3.1.7.1 | Verify available volume of sodium pentaborate solution is within the limits of Figure 3.1.7-1. | ~~24 hours~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.2 | Verify temperature of sodium pentaborate solution is ≥ 70°F. | ~~24 hours~~ |
| SR 3.1.7.3 | Verify temperature of pump suction piping is ≥ 70°F. | ~~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><br>AND<br><br>Once within 24 hours after water or boron is added to solution<br><br>AND<br><br>Once within 24 hours after solution temperature is restored to ≥ 70°F |
| 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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.7 | Verify each pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1220 psig. | In accordance with the Inservice Testing Program |
| SR 3.1.7.8 | Verify flow through one SLC subsystem from pump into reactor pressure vessel. | ~~24 months on a STAGGERED TEST BASIS~~ |
| SR 3.1.7.9 | Verify all piping between storage tank and pump suction is unblocked. | ~~24 months~~<br><br>AND<br><br>Once within 24 hours after pump suction piping temperature is restored to ≥ 70°F |

In accordance with the Surveillance Frequency Control Program

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 ≤ 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. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

## 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 ≥ 21.6% 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 < 21.6% 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 ≥ 21.6% RTP<br>AND<br>~~24 hours thereafter~~ |

In accordance with the Surveillance Frequency Control Program

## 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 ≥ 21.6% 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 < 21.6% 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 ≥ 21.6% RTP<br>AND<br>~~24 hours thereafter~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

## 3.2 POWER DISTRIBUTION LIMITS

### 3.2.3 LINEAR HEAT GENERATION RATE (LHGR)

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

APPLICABILITY: THERMAL POWER ≥ 21.6% 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 < 21.6% 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 ≥ 21.6% RTP<br>AND<br>~~24 hours thereafter~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

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

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

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | ~~12 hours~~ |
| SR 3.3.1.1.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 21.6% RTP.<br>----------<br><br>Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power ≤ 2% RTP while operating at ≥ 21.6% 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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.5 | Perform CHANNEL FUNCTIONAL TEST. | ~~7 days~~ |
| SR 3.3.1.1.6 | Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap. | Prior to withdrawing SRMs from the fully inserted position |
| SR 3.3.1.1.7 | ----------NOTE----------<br>Only required to be met during entry into MODE 2 from MODE 1.<br>----------<br><br>Verify the IRM and APRM channels overlap. | ~~7 days~~ |
| SR 3.3.1.1.8 | Calibrate the local power range monitors. | ~~2000 MWD/T average core exposure~~ |
| SR 3.3.1.1.9 | Perform CHANNEL FUNCTIONAL TEST. | ~~92 days~~ |
| SR 3.3.1.1.10 | Calibrate the analog trip module. | ~~92 days~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.11 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br><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><br>Perform CHANNEL CALIBRATION. | ~~184 days~~ |
| SR 3.3.1.1.12 | Perform CHANNEL FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.1.1.13 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br><br>2. For IRMs, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br><br>Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.1.1.14 | Verify the APRM Flow Biased Simulated Thermal Power-High time constant is within the limits specified in the COLR. | ~~24 months~~ |
| SR 3.3.1.1.15 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.16 | Verify Turbine Stop Valve Closure and Turbine Control Valve Fast Closure Trip Oil Pressure-Low Functions are not bypassed when THERMAL POWER is ≥ 33.3% RTP. | ~~24 months~~ |
| SR 3.3.1.1.17 | ----------NOTES----------<br>1. Neutron detectors are excluded.<br><br>2. For Functions 3, 4, and 5 in Table 3.3.1.1-1, the channel sensors are excluded.<br><br>~~3. The STAGGERED TEST BASIS Frequency for each Function shall be determined on a per channel basis.~~<br>----------<br><br>Verify the RPS RESPONSE TIME is within limits. | ~~24 months on a STAGGERED TEST BASIS~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

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

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| 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><br>Verify count rate is ≥ 3.0 cps. | ~~12 hours during CORE ALTERATIONS~~<br><br>~~AND~~<br><br>~~24 hours~~ |
| SR 3.3.1.2.5 | ----------NOTE----------<br>Not required to be performed until 12 hours after IRMs on Range 2 or below.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | ~~31 days~~ |
| SR 3.3.1.2.6 | ----------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. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.3.1 | Perform CHANNEL FUNCTIONAL TEST. | ~~184 days~~ |
| SR 3.3.1.3.2 | Calibrate the local power range monitors. | ~~2000 MWD/T average core exposure~~ |
| SR 3.3.1.3.3 | ----------NOTE----------<br>Neutron detectors are excluded.<br>---<br><br>Perform CHANNEL CALIBRATION. The setpoints for the trip function shall be as specified in the COLR. | ~~24 months~~ |
| SR 3.3.1.3.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.1.3.5 | Verify OPRM is not bypassed when THERMAL POWER is ≥ 25% RTP and recirculation drive flow is ≤ the value corresponding to 60% of rated core flow. | ~~24 months~~ |
| SR 3.3.1.3.6 | ----------NOTE----------<br>Neutron detectors are excluded.<br>---<br><br>Verify the RPS RESPONSE TIME is within limits. | ~~24 months on a STAGGERED TEST BASIS~~ |

In accordance with the Surveillance Frequency Control Program

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 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 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 greater than the RWL high power setpoint (HPSP) ---------- 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 > 29.2% RTP and less than or equal to the RWL HPSP. ---------- 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 in MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST. | ~~92 days~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.2.1.4 | ----------NOTE----------<br>Not required to be performed until 1 hour after THERMAL POWER is ≤ 16.7% RTP in MODE 1.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | ~~92 days~~ |
| SR 3.3.2.1.5 | Calibrate the low power setpoint analog trip modules. The Allowable Value shall be > 16.7% RTP and ≤ 29.2% RTP. | ~~92 days~~ |
| 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. | ~~24 months~~ |
| 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><br>Perform CHANNEL FUNCTIONAL TEST. | ~~24 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) is in conformance with applicable analyses 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 |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.1.1 | ----------NOTE----------<br>Applicable for each Function in Table 3.3.3.1-1.<br>----------<br><br>Perform CHANNEL CHECK. | ~~31 days~~ |
| SR 3.3.3.1.2 | Deleted | |
| SR 3.3.3.1.3 | ----------NOTE----------<br>Applicable for each Function in Table 3.3.3.1-1.<br>----------<br><br>Perform CHANNEL CALIBRATION. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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~~ In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.3.2.2 | Verify each required control circuit and transfer switch is capable of performing the intended functions. | ~~24 months~~ |
| SR 3.3.3.2.3 | Perform CHANNEL CALIBRATION for each required instrumentation channel. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. One or more Functions with two channels inoperable. | B.1 Place one channel in affected Function in trip. | 6 hours |
| C. One or more Functions with three or more channels inoperable. | C.1 Restore two channels in affected Function to OPERABLE status. | 2 hours |
| D. Required Action and associated Completion Time not met. | D.1 Remove the associated recirculation pump fast speed breaker from service.<br><br>OR<br><br>D.2 Reduce THERMAL POWER to < 33.3% RTP. | 8 hours<br><br><br><br><br>8 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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.4.1.2 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. TSV Closure: ≤ 7% closed; and<br><br>b. TCV Fast Closure, Trip Oil Pressure-Low: ≥ 465 psig. | ~~24 months~~ |
| SR 3.3.4.1.3 | Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation. | ~~24 months~~ |
| SR 3.3.4.1.4 | Verify TSV Closure and TCV Fast Closure, Trip Oil Pressure-Low Functions are not bypassed when THERMAL POWER is ≥ 33.3% RTP. | ~~24 months~~ |
| SR 3.3.4.1.5 | ~~----------NOTE----------~~<br>~~The STAGGERED TEST BASIS Frequency shall be determined on a per Function basis.~~<br>~~----------~~<br><br>Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits. | ~~24 months on a STAGGERED TEST BASIS~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time not met. | C.1 Remove the associated recirculation pump from service.<br><br>OR<br><br>C.2 Be in MODE 2. | 6 hours<br><br><br><br><br>6 hours |

SURVEILLANCE REQUIREMENTS

| 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~~ |
| 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: ≥ -50.0 inches; and<br><br>b. Reactor Steam Dome Pressure-High: ≤ 1143 psig. | ~~24 months~~ |
| SR 3.3.4.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

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

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c, 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 analog trip module. | ~~92 days~~ |
| SR 3.3.5.1.4 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.5.1.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.5.1.6 | Perform CHANNEL CALIBRATION. | ~~18 months~~ |

In accordance with the Surveillance Frequency Control Program

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 analog trip module. | ~~92 days~~ |
| SR 3.3.5.2.4 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.5.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.5.2.6 | Perform CHANNEL CALIBRATION. | ~~18 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment and Drywell 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 analog trip module. | ~~92 days~~ |
| SR 3.3.6.1.4 | Perform CHANNEL CALIBRATION. | ~~92 days~~ |
| SR 3.3.6.1.5 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.6.1.6 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.6.1.7 | ----------NOTE----------<br>~~1.~~ Channel sensors are excluded.<br>~~2. The STAGGERED TEST BASIS Frequency for each Function shall be determined on a per channel basis.~~<br>----------<br><br>Verify the ISOLATION SYSTEM RESPONSE TIME for the main steam isolation valves is within limits. | In accordance with the Surveillance Frequency Control Program<br><br>~~24 months on a STAGGERED TEST BASIS~~ |
| SR 3.3.6.1.8 | Perform CHANNEL CALIBRATION. | ~~18 months~~ |

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 analog trip module. | ~~92 days~~ |
| SR 3.3.6.2.4 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.6.2.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.6.2.6 | Perform CHANNEL CALIBRATION. | ~~18 months~~ |

In accordance with the Surveillance Frequency Control Program

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~~ |
| SR 3.3.6.3.3 | Calibrate the analog trip module. | ~~92 days~~ |
| SR 3.3.6.3.4 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.6.3.5 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.6.3.6 | Perform CHANNEL CALIBRATION. | ~~18 months~~ |

In accordance with the Surveillance Frequency Control Program

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 analog trip module. | ~~92 days~~ |
| SR 3.3.6.4.4 | Calibrate the analog comparator unit. | ~~92 days~~ |
| SR 3.3.6.4.5 | Perform CHANNEL CALIBRATION. | ~~92 days~~ |
| SR 3.3.6.4.6 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.6.4.7 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |
| SR 3.3.6.4.8 | Perform CHANNEL CALIBRATION. | ~~18 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.3.6.5.1 Perform CHANNEL FUNCTIONAL TEST. | ~~92 days~~ |
| ----------NOTE----------<br>1. If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined As-Found Tolerance band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.<br>2. The instrument channel setpoint shall be reset to a value within the As-Left Tolerance of the Actual Trip Setpoint; otherwise, the channel shall be declared inoperable.<br>3. The Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the predefined As-Found Tolerance and As-Left Tolerance bands shall be specified in the ORM.<br>---<br>SR 3.3.6.5.2 Calibrate the analog trip module. | ~~92 days~~ |
| ----------NOTE----------<br>1. If the as-found channel setpoint is conservative with respect to the Allowable Value but outside its predefined As-Found Tolerance band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.<br>2. The instrument channel setpoint shall be reset to a value within the As-Left Tolerance of the Actual Trip Setpoint; otherwise, the channel shall be declared inoperable.<br>3. The Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the predefined As-Found Tolerance and As-Left Tolerance bands shall be specified in the ORM.<br>---<br>SR 3.3.6.5.3 Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. Relief Function<br><br>Low: ≤ 1118 psig<br>Medium: ≤ 1128 psig<br>High: ≤ 1138 psig<br><br>b. LLS Function<br><br>Low open: ≤ 1044 psig<br>close: ≤ 937 psig<br>Medium open: ≤ 1084 psig<br>close: ≤ 947 psig<br>High open: ≤ 1124 psig<br>close: ≤ 957 psig | In accordance with the Surveillance Frequency Control Program<br><br>~~24 months~~ |
| SR 3.3.6.5.4 Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Required Action and associated Completion Time not met. | B.1 Place one Control Room Ventilation subsystem in the high radiation mode of operation. | 1 hour |
| | OR | |
| | B.2 Declare associated Control Room Ventilation subsystem inoperable. | 1 hour |

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 Control Room Ventilation 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 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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 | Deleted | |
| SR 3.3.8.1.2 | Perform CHANNEL FUNCTIONAL TEST. | ~~31 days~~ |
| SR 3.3.8.1.3 | Perform CHANNEL CALIBRATION. | ~~24 months~~ |
| SR 3.3.8.1.4 | Perform LOGIC SYSTEM FUNCTIONAL TEST. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.8.2.1 | ----------NOTE----------<br>Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | ~~184 days~~ |
| SR 3.3.8.2.2 | Perform CHANNEL CALIBRATION. The Allowable Values shall be:<br><br>a. Overvoltage<br><br>Bus A ≤ 127.3 V<br>Bus B ≤ 126.7 V<br><br>b. Undervoltage<br><br>Bus A ≥ 115.0 V<br>Bus B ≥ 114.7 V<br><br>c. Underfrequency (with time delay ≤ 4.0 seconds)<br><br>Bus A ≥ 57 Hz<br>Bus B ≥ 57 Hz | ~~24 months~~ |
| SR 3.3.8.2.3 | Perform a system functional test. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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~~<br>In accordance with the Surveillance Frequency Control Program |

## 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. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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><br>2. Not required to be performed until 24 hours after > 21.6% 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~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.4.1 | Verify the safety function lift setpoints of the required S/RVs are as follows:<br><br>Number of S/RVs — Setpoint (psig)<br>7 — 1165 ± 34.9<br>5 — 1180 ± 35.4<br>4 — 1190 ± 35.7<br><br>Following testing, lift settings shall be within ± 1%. | In accordance with the Inservice Testing Program |
| 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. | ~~24 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 actuator strokes when manually actuated. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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 LEAKAGE, total LEAKAGE, and unidentified LEAKAGE increase are within limits. | ~~12 hours~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.7.1 | Perform CHANNEL CHECK of required drywell atmospheric monitoring system. | ~~12 hours~~ |
| 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. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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~~<br>In accordance with the Surveillance Frequency Control Program |

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 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 3.4.9.1 | ----------NOTE----------<br>Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR cut in permissive pressure.<br>----------<br><br>Verify one RHR shutdown cooling subsystem or recirculation pump is operating. | In accordance with the Surveillance Frequency Control Program<br>~~12 hours~~ |

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. | 1 hour from discovery of no reactor coolant circulation<br><br>AND<br><br>Once per 12 hours thereafter |
| | AND<br><br>B.2 Monitor reactor coolant temperature and pressure. | 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~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.11.1 | ----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---------- | |
| | Verify: | ~~30 minutes~~ In accordance with the Surveillance Frequency Control Program |
| | a. RCS pressure and RCS temperature are within the limits of Figures 3.4.11-1, 3.4.11-2 and 3.4.11-3; and | |
| | b. RCS heatup and cooldown rates are as indicated on the figures. | |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.11.5 | ----------NOTES----------<br>1. Only required to be performed when tensioning the reactor vessel head bolting studs.<br><br>2. Only required to be met with > 10% of the reactor vessel head bolting studs fully tensioned.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are ≥ 70°F. | ~~30 minutes~~ |
| SR 3.4.11.6 | ----------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 ≥ 70°F. | ~~30 minutes~~ |
| SR 3.4.11.7 | ----------NOTE----------<br>Not required to be performed until 12 hours after RCS temperature ≤ 90°F in MODE 4.<br>----------<br><br>Verify reactor vessel flange and head flange temperatures are ≥ 70°F. | ~~12 hours~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

## 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~~ In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.1.1 | Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve. | ~~31 days~~ |
| SR 3.5.1.2 | ----------NOTE----------<br>Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the residual heat removal cut in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable.<br>----------<br><br>Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | In accordance with the Surveillance Frequency Control Program<br><br>~~31 days~~ |
| SR 3.5.1.3 | Verify ADS accumulator supply pressure is ≥ 140 psig. | ~~31 days~~ |
| SR 3.5.1.4 | Verify each ECCS pump develops the specified flow rate with the specified pump differential pressure.<br><br>SYSTEM — FLOW RATE — PUMP DIFFERENTIAL PRESSURE<br>LPCS — ≥ 5010 gpm — ≥ 290 psid<br>LPCI — ≥ 5050 gpm — ≥ 113 psid<br>HPCS — ≥ 5010 gpm — ≥ 363 psid | In accordance with the Inservice Testing Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| 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. | ~~24 months~~ |
| 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. | ~~24 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 actuator strokes when manually actuated. | ~~24 months~~ |
| SR 3.5.1.8 | ----------NOTE----------<br>ECCS actuation instrumentation is excluded.<br>----------<br><br>Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limits. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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 ft 8 inches. | ~~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 ft 8 inches; or<br>b. RCIC storage tank available water volume is ≥ 125,000 gal. | ~~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~~ |
| SR 3.5.2.4 | ----------NOTE----------<br>One low pressure coolant injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned and not otherwise inoperable.<br>----------<br><br>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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.5 | Verify each required ECCS pump develops the specified flow rate with the specified pump differential pressure.<br><br>SYSTEM — FLOW RATE — PUMP DIFFERENTIAL PRESSURE<br>LPCS — ≥ 5010 gpm — ≥ 290 psid<br>LPCI — ≥ 5050 gpm — ≥ 113 psid<br>HPCS — ≥ 5010 gpm — ≥ 363 psid | In accordance with the Inservice Testing Program |
| 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. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.3.1 | Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve. | ~~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 RCIC steam supply pressure ≤ 1045 psig and ≥ 920 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure. | ~~92 days~~ |
| SR 3.5.3.4 | ----------NOTE----------<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 RCIC steam supply pressure ≤ 150 psig and ≥ 135 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure. | ~~24 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| 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. | In accordance with the Surveillance Frequency Control Program<br><br>~~24 months~~ |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.2.1 | ----------NOTES----------<br>1. Only required to be met during MODES 1, 2, and 3.<br><br>2. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test.<br><br>3. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1.<br>----------<br><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 | ----------NOTE----------<br>Only required to be performed upon entry or exit through the primary containment air lock.<br>----------<br><br>Verify only one door in the primary containment air lock can be opened at a time. | ~~184 days~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.1 | ----------NOTES----------<br>1. Only required to be met in MODES 1, 2, and 3.<br><br>2. Not required to be met when the 36 inch primary containment purge valves are open for pressure control, ALARA or air quality considerations for personnel entry. Also not required to be met during Surveillances or special testing on the purge system that requires the valves to be open. The 36 inch primary containment purge lines shall not be opened with a 12 inch primary containment purge line open nor with a drywell vent and purge supply or exhaust line open.<br>----------<br><br>Verify each 36 inch primary containment purge valve is closed. | ~~31 days~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.2 | ----------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 is required to be closed during accident conditions is closed. | ~~31 days~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.4 | Verify the isolation time of each power operated and each automatic PCIV, except MSIVs, is within limits. | In accordance with the Inservice Testing Program |
| SR 3.6.1.3.5 | ----------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. | Once within 92 days after opening the valve<br><br>AND<br><br>In accordance with the Primary Containment Leakage Rate Testing Program |
| SR 3.6.1.3.6 | Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds. | In accordance with the Inservice Testing Program |
| SR 3.6.1.3.7 | Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.3.11 | ----------NOTE----------<br>Only required to be met in MODES 1, 2, and 3.<br>----------<br><br>Verify that the combined leakage rate for both primary containment feedwater penetrations is ≤ 2 gpm when pressurized to ≥ 1.1 $P_a$. | In accordance with the Primary Containment Leakage Rate Testing Program. |
| SR 3.6.1.3.12 | Verify each instrumentation line excess flow check primary containment isolation valve actuates within the required range. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

## 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 ≥ -0.25 psid and ≤ 0.25 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><br>AND<br><br>B.2 Be in MODE 4. | 12 hours<br><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~~<br>In accordance with the Surveillance Frequency Control Program |

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.5 Primary Containment Air Temperature

LCO 3.6.1.5 Primary containment average air temperature shall be ≤ 122°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><br>AND<br><br>B.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.6.1.5.1 Verify primary containment average air temperature is within limit. | ~~24 hours~~<br>In accordance with the Surveillance Frequency Control Program |

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 actuator strokes when manually actuated. | ~~24 months~~ |
| 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. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

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 ≥ 3800 gpm on recirculation flow through the associated heat exchanger to the suppression pool. | In accordance with the Inservice Testing Program |
| 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. | ~~24 months~~ |
| SR 3.6.1.7.4 | Verify each spray nozzle is unobstructed. | Following activities that could result in nozzle blockage |

In accordance with the Surveillance Frequency Control Program

## 3.6 CONTAINMENT SYSTEMS

### 3.6.1.9 Feedwater Leakage Control System (FWLCS)

LCO 3.6.1.9 Two FWLCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One FWLCS subsystem inoperable. | A.1 Restore FWLCS subsystem to OPERABLE status. | 30 days |
| B. Two FWLCS subsystems inoperable. | B.1 Restore one FWLCS subsystem to OPERABLE status. | 7 days |
| C. Required Action and associated Completion Time not met. | ----------NOTE----------<br>LCO 3.0.4.a is not applicable when entering MODE 3.<br>----------<br><br>C.1 Be in MODE 3. | <br><br><br><br>12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.1.9.1 | Perform a system functional test of each FWLCS subsystem. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

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

In accordance with the Surveillance Frequency Control Program

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be:

a. ≥ 18 ft 11 inches and ≤ 19 ft 5 inches,

b. ≥ 18 ft 11 inches and ≤ 20 ft 1 inches, in MODE 3 with reactor pressure less than 235 psig

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~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.3.1 | Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position. | ~~31 days~~<br>In accordance with the Surveillance Frequency Control Program |
| SR 3.6.2.3.2 | Verify each RHR pump develops a flow rate ≥ 4550 gpm through the associated heat exchanger to the suppression pool. | In accordance with the Inservice Testing Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.4.1 | Verify upper containment pool water level is:<br><br>a. ≥ el. 825 ft 6 inches;<br><br>b. ≥ el. 825 ft 10 inches when the inclined fuel transfer pool to steam dryer storage pool gate is not open; and<br><br>c. ≥ el. 827 ft 1 inch when the reactor cavity to steam dryer storage pool gate is not open.<br><br>OR<br><br>d. Reactor cavity pool level ≥ el. 824 ft 7 inches in MODE 3 with reactor pressure less than 235 psig.<br><br>OR<br><br>e. Suppression pool water level ≥ 19 ft 9 inches in MODE 3 with reactor pressure less than 235 psig. | ~~24 hours~~ |
| SR 3.6.2.4.2 | Verify upper containment pool water temperature is ≤ 120°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~~<br><br>In accordance with the Surveillance Frequency Control Program |
| SR 3.6.2.4.4 | ----------NOTE----------<br>Actual makeup to the suppression pool may be excluded.<br>----------<br><br>Verify each SPMU subsystem automatic valve actuates to the correct position on an actual or simulated automatic initiation signal. | ~~24 months~~ |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3. | 12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.2.1 | Energize each primary containment and drywell hydrogen igniter division and perform current versus voltage measurements to verify required igniters in service. | ~~184 days~~ |
| SR 3.6.3.2.2 | ----------NOTE----------<br>Not required to be performed until 92 days after discovery of four or more igniters in the division inoperable.<br>----------<br><br>Energize each primary containment and drywell hydrogen igniter division and perform current versus voltage measurements to verify required igniters in service. | ~~92 days~~ |
| SR 3.6.3.2.3 | Verify each required igniter in inaccessible areas develops sufficient current draw for a ≥ 1700°F surface temperature. | ~~24 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.2.4 | Verify each required igniter in accessible areas develops a surface temperature of ≥ 1700°F. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.3.3.1 | Operate each Containment/Drywell Hydrogen Mixing System. | ~~92 days~~ |
| SR 3.6.3.3.2 | Verify each Containment/Drywell Hydrogen Mixing System flow rate is ≥ 800 scfm. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Secondary containment inoperable during movement of recently irradiated fuel assemblies in the primary or secondary containment, or during OPDRVs. | C.1 --------NOTE--------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in the primary and secondary containment. | Immediately |
| | AND | |
| | C.2 Initiate action to suspend OPDRVs. | Immediately |

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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.1.3 | Verify one door in each access to secondary containment is closed, except during normal 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 within the time required using one Standby Gas Treatment (SGT) subsystem. | ~~24 months on a STAGGERED TEST BASIS for each SGT 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 ≤ 4400 cfm. | ~~24 months on a STAGGERED TEST BASIS for each SGT subsystem~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.4.2.1 | ----------NOTES----------<br>1. Valves, dampers, and blind flanges in high radiation areas may be verified by use of administrative means.<br><br>2. Not required to be met for SCIDs that are open under administrative controls.<br>----------<br><br>Verify each secondary containment isolation manual valve, damper, and blind flange that 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 and each automatic SCID is within limits. | ~~92 days~~ |
| SR 3.6.4.2.3 | Verify each automatic SCID actuates to the isolation position on an actual or simulated automatic isolation signal. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Two SGT subsystems inoperable during movement of recently irradiated fuel assemblies in the primary or secondary containment, or during OPDRVs. | E.1 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. | ~~24 months~~ |
| SR 3.6.4.3.4 | Verify each SGT filter cooling bypass damper can be opened and the fan started. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.1.2 | ----------NOTE----------<br>An inoperable air lock door does not invalidate the previous successful performance of the overall drywell air lock leakage rate test.<br>----------<br><br>Perform overall drywell air lock leakage rate test at ≥ 3.0 psig. | In accordance with the Surveillance Frequency Control Program<br>~~24 months~~ |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.1.3 | 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. | 24 months following 2 consecutive tests with bypass leakage greater than the bypass leakage limit until 2 consecutive tests are less than or equal to the bypass leakage limit<br><br>AND<br><br>48 months following a test with bypass leakage greater than the bypass leakage limit<br><br>AND<br><br>-----NOTES-----<br>1. The next required performance of this SR may be delayed to November 23, 2008.<br>2. SR 3.0.2 is not applicable for extensions > 12 months.<br>----------<br><br>~~120 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.2.1 | ----------NOTE----------<br>Only required to be performed upon entry into drywell.<br>----------<br><br>Verify only one door in the drywell air lock can be opened at a time. | In accordance with the Surveillance Frequency Control Program<br>~~24 months~~ |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.3.1 | Verify each 24 inch drywell vent and purge supply isolation valve is sealed closed. | ~~31 days~~ |
| SR 3.6.5.3.2 | ----------NOTE----------<br>Not required to be met when the 36 inch and either the 10 inch or 24 inch drywell vent and purge exhaust valves are open for pressure control, ALARA or air quality considerations for personnel entry. Also not required to be met during Surveillances or special testing of the purge system that requires the valves to be open. The drywell vent and purge exhaust valves shall not be opened with a 12 inch or 36 inch primary containment purge system supply or exhaust line open.<br>----------<br><br>Verify each 10 inch, 24 inch, and 36 inch drywell vent and purge exhaust isolation valve is closed. | ~~31 days~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.3.3 | ----------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 drywell isolation valves that are open under administrative controls.<br>----------<br><br>Verify each required drywell isolation manual valve and blind flange that 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 required power operated and each required automatic drywell isolation valve is within limits. | In accordance with the Inservice Testing Program |
| SR 3.6.5.3.5 | Verify each required automatic drywell isolation valve actuates to the isolation position on an actual or simulated isolation signal. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

## 3.6 CONTAINMENT SYSTEMS

### 3.6.5.4 Drywell Pressure

LCO 3.6.5.4 Drywell-to-primary containment differential pressure shall be ≥ -0.2 psid and ≤ 1.0 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><br>AND<br><br>B.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.4.1 | Verify drywell-to-primary containment differential pressure is within limits. | ~~12 hours~~<br>In accordance with the Surveillance Frequency Control Program |

3.6 CONTAINMENT SYSTEMS

3.6.5.5 Drywell Air Temperature

LCO 3.6.5.5 Drywell average air temperature shall be ≤ 150°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><br>AND<br><br>B.2 Be in MODE 4. | 12 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.6.5.5.1 Verify drywell average air temperature is within limit. | ~~24 hours~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.5.6.1 | ----------NOTES----------<br>1. Not required to be met for drywell post-LOCA vacuum relief valves open during Surveillances.<br><br>2. Not required to be met for drywell post-LOCA vacuum relief valves open when performing their intended function.<br>----------<br><br>Verify each drywell post-LOCA vacuum relief valve is closed. | ~~7 days~~ |
| SR 3.6.5.6.2 | Perform a functional test of each drywell post-LOCA vacuum relief valve. | ~~31 days~~ |
| SR 3.6.5.6.3 | Verify the opening pressure differential of each drywell post-LOCA vacuum relief valve is ≤ 0.2 psid. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

Actions (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Required Action and associated Completion Time of Condition A not met.<br><br>OR<br><br>Division 1 and 2 SX subsystems inoperable. | D.1 Be in MODE 3.<br><br>AND<br><br>D.2 Be in MODE 4. | 12 hours<br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.1.1 | Verify UHS water volume is ≥ 593 acre-ft. | In accordance with UHS Erosion, Sediment Monitoring, and Dredging Program |
| SR 3.7.1.2 | Verify each required SX 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 3.7.1.3 | Verify each SX subsystem actuates on an actual or simulated initiation signal. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

## 3.7 PLANT SYSTEMS

### 3.7.2 Division 3 Shutdown Service Water (SX) Subsystem

LCO 3.7.2 The Division 3 SX subsystem shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Division 3 SX subsystem inoperable. | A.1 Declare High Pressure Core Spray System inoperable. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.2.1 | Verify each required Division 3 SX 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 3.7.2.2 | Verify the Division 3 SX subsystem actuates on an actual or simulated initiation signal. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| G. Two Control Room Ventilation subsystems inoperable during movement of irradiated fuel assemblies in the primary or secondary containment, during CORE ALTERATIONS, or during OPDRVs. | G.1 Suspend movement of irradiated fuel assemblies in the primary and secondary containment. | Immediately |
| | AND | |
| | G.2 Suspend CORE ALTERATIONS. | Immediately |
| OR | | |
| One or more Control Room Ventilation subsystems inoperable due to inoperable CRE boundary during movement of irradiated fuel assemblies in the primary or secondary containment, during CORE ALTERATIONS, or during OPDRVs. | AND<br>G.3 Initiate action to suspend OPDRVs. | Immediately |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.3.1 | Operate each Control Room Ventilation subsystem with flow through the makeup filter for ≥ 10 continuous hours with the heaters operating. | ~~31 days~~ |
| SR 3.7.3.2 | Operate each Control Room Ventilation subsystem with flow through the recirculation filter for ≥ 15 minutes. | ~~31 days~~ |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.3.3 | Perform required Control Room Ventilation filter testing in accordance with the Ventilation Filter Testing Program (VFTP). | In accordance with the VFTP |
| SR 3.7.3.4 | Verify each Control Room Ventilation subsystem actuates on an actual or simulated initiation signal. | ~~24 months~~ In accordance with the Surveillance Frequency Control Program |
| SR 3.7.3.5 | Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program. | In accordance with the Control Room Envelope Habitability Program |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Required Action and associated Completion Time of Condition B not met during movement of irradiated fuel assemblies in the primary or secondary containment, during CORE ALTERATIONS, or during OPDRVs. | ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- | |
| | E.1 Suspend movement of irradiated fuel assemblies in the primary and secondary containment. | Immediately |
| | AND | |
| | E.2 Suspend CORE ALTERATIONS. | Immediately |
| | AND | |
| | E.3 Initiate action to suspend OPDRVs. | 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. | ~~24 months~~ In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.5.1 | Verify the radioactivity rate of the noble gases is ≤ 289 mCi/second after decay of 30 minutes. | Once within 4 hours after a ≥ 50% increase in the nominal steady state fission gas release rate after factoring out increases due to changes in THERMAL POWER level |
| SR 3.7.5.2 | ----------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 radioactivity rate of the noble gases is ≤ 289 mCi/second after decay of 30 minutes. | ~~31 days~~<br>In accordance with the Surveillance Frequency Control Program |

## 3.7 PLANT SYSTEMS

### 3.7.6 Main Turbine Bypass System

LCO 3.7.6 The Main Turbine Bypass System shall be OPERABLE.

APPLICABILITY: THERMAL POWER ≥ 21.6% RTP.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Main Turbine Bypass System inoperable. | A.1 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 < 21.6% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.6.1 | Verify one complete cycle of each main turbine bypass valve. | ~~31 days~~ |
| SR 3.7.6.2 | Perform a system functional test. | ~~24 months~~ |
| SR 3.7.6.3 | Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

## 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~~ In accordance with the Surveillance Frequency Control Program |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| G. Three or more required AC sources inoperable. | G.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 offsite circuit. | ~~7 days~~ |
| SR 3.8.1.2 | ----------NOTES----------<br>1. Performance of SR 3.8.1.7 satisfies this SR.<br>2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.<br>3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.<br>----------<br><br>Verify each DG starts from standby conditions and achieves steady state voltage ≥ 4084 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | ~~As specified in Table 3.8.1-1~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

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><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 operates for ≥ 60 minutes at a load ≥ 3482 kW for DG 1A, ≥ 3488 kW for DG 1B, and ≥ 1980 kW for DG 1C. | ~~As specified in Table 3.8.1-1~~ |
| SR 3.8.1.4 | Verify each day tank contains ≥ 385 gal of fuel oil for DG 1A and DG 1B and ≥ 240 gal for DG 1C. | ~~31 days~~ |
| SR 3.8.1.5 | Check for and remove accumulated water from each day tank. | ~~31 days~~ |
| SR 3.8.1.6 | Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank. | ~~31 days~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

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 ≤ 12 seconds, voltage ≥ 4084 V and frequency ≥ 58.8 Hz; and<br><br>b. Steady state voltage ≥ 4084 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | ~~184 days~~ |
| SR 3.8.1.8 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1 or 2. However, 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. | ~~24 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.9 | ----------NOTE----------<br>1. 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.<br>----------<br><br>Verify each DG rejects a load greater than or equal to its associated single largest post accident load and following load rejection, the engine speed is maintained less than nominal plus 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is lower. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.10 | ----------NOTE----------<br>Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify each DG operating at a power factor ≤ 0.9 does not trip and voltage is maintained ≤ 5000 V for DG 1A and DG 1B and ≤ 5824 V for DG 1C during and following a load rejection of a load ≥ 3482 kW for DG 1A, ≥ 3488 kW for DG 1B, and ≥ 1980 kW for DG 1C. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

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 be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR.<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 for Divisions 1 and 2; 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,<br><br>3. maintains steady state voltage ≥ 4084 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. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |
| | | (continued) |

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 be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br><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 ≥ 4084 V and frequency ≥ 58.8 Hz;<br><br>b. Achieves steady state voltage ≥ 4084 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and<br><br>c. Operates for ≥ 5 minutes. | ~~24 months~~ |
| SR 3.8.1.13 | ----------NOTE----------<br>Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify each DG's automatic trips are bypassed on an actual or simulated ECCS initiation signal except:<br><br>a. Engine overspeed;<br><br>b. Generator differential current; and<br><br>c. Overcrank for DG 1A and DG 1B. | ~~24 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

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. Credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours:<br><br>a. For ≥ 2 hours loaded ≥ 4062 kW for DG 1A, ≥ 4069 kW for DG 1B, and ≥ 2310 kW for DG 1C; and<br><br>b. For the remaining hours of the test loaded ≥ 3482 kW for DG 1A, ≥ 3488 kW for DG 1B, and ≥ 1980 kW for DG 1C. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.15 | ----------NOTE----------<br>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3482 kW for DG 1A, ≥ 3488 kW for DG 1B, and ≥ 1980 kW for DG 1C.<br><br>Momentary transients outside of the 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 ≥ 4084 V and frequency ≥ 58.8 Hz and<br><br>b. Steady state voltage ≥ 4084 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.16 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. However, 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. | ~~24 months~~ |
| SR 3.8.1.17 | ----------NOTE----------<br>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 loads from offsite power. | ~~24 months~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.18 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR.<br>----------<br><br>Verify the sequence time is within ± 10% of design for each load sequence timer. | In accordance with the Surveillance Frequency Control Program<br><br>~~24 months~~ |

(continued)

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 be performed in MODE 1, 2, or 3. However, 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 for Divisions 1 and 2; 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,<br><br>3. achieves steady state voltage ≥ 4084 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. | ~~24 months~~<br>In accordance with the Surveillance Frequency Control Program |

(continued)

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 DG achieves:<br><br>a. In ≤ 12 seconds, voltage ≥ 4084 V and frequency ≥ 58.8 Hz; and<br><br>b. Steady state voltage ≥ 4084 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | ~~10 years~~<br>In accordance with the Surveillance Frequency Control Program |

~~Table 3.8.1-1 (page 1 of 1)~~
~~Diesel Generator Test Schedule~~

| ~~NUMBER OF FAILURES IN LAST 25 VALID TESTS[a]~~ | ~~FREQUENCY~~ |
|---|---|
| ~~≤ 3~~ | ~~31 days~~ |
| ~~≥ 4~~ | ~~7 days[b] (but ≥ 24 hours)~~ |

~~(a) Criteria for determining number of failures and valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, where the number of tests and failures is determined on a per DG basis.~~

~~(b) This test frequency shall be maintained until seven consecutive failure free starts from standby conditions and load and run tests have been performed. If, subsequent to the 7 failure free tests, 1 or more additional failures occur such that there are again 4 or more failures in the last 25 tests, the testing interval shall again be reduced as noted above and maintained until 7 consecutive failure free tests have been performed.~~

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| 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. ≥ 48,000 gal of fuel for DG 1A;<br><br>b. ≥ 45,000 gal of fuel for DG 1B; and<br><br>c. ≥ 29,500 gal of fuel for DG 1C. | ~~31 days~~ |
| SR 3.8.3.2 | Verify lube oil inventory is:<br><br>a. ≥ 347 gal for each 16 cylinder engine; and<br><br>b. ≥ 284 gal for each 12 cylinder engine. | ~~31 days~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.3.3 | Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program. | In accordance with the Diesel Fuel Oil Testing Program |
| SR 3.8.3.4 | Verify each required DG air start receiver pressure is ≥ 200 psig. | ~~31 days~~ |
| SR 3.8.3.5 | Check for and remove accumulated water from each fuel oil storage tank. | ~~92 days~~ |

In accordance with the Surveillance Frequency Control Program

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 Division 1 and 2 battery charger supplies ≥ 300 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours and each Division 3 and 4 battery charger supplies ≥ 100 amps 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 12 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. | ~~24 months~~ |
| 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, credit may be taken for unplanned<br><br>events that satisfy this SR.<br>----------<br><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. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| 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~~ |
| SR 3.8.6.5 | Verify each battery connected cell voltage is ≥ 2.07 V. | ~~92 days~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.6.6 | ----------NOTE----------<br>This Surveillance shall not be performed in MODE 1, 2, or 3. However, 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. | In accordance with the Surveillance Frequency Control Program<br>~~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 |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Both RPS solenoid bus inverters inoperable. | E.1 De-energize one RPS solenoid bus. | 1 hour |
| F. Required Action and associated Completion Time for Condition C, D, or E not met. | 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 3.8.7.1 | Verify correct inverter voltage, frequency, and alignment to required uninterruptible AC buses and RPS solenoid buses. | ~~7 days~~<br>In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.8.1 | Verify correct inverter voltage, frequency, and alignments to required uninterruptible AC buses. | ~~7 days~~ In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.9.1 | Verify correct breaker alignments and voltage to required AC, DC, and uninterruptible AC bus electrical power distribution subsystems. | ~~7 days~~<br>In accordance with the Surveillance Frequency Control Program |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. (continued) | 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 uninterruptible AC 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 uninterruptible AC bus electrical power distribution subsystems. | ~~7 days~~ In accordance with the Surveillance Frequency Control Program |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.11.1 | For each required SVC Protection System, perform a local, visual check of the SVC system control and status panel to confirm satisfactory operation. | ~~24 hours~~ |
| SR 3.8.11.2 | Perform a system functional test of each SVC protection subsystem, including breaker actuation. | ~~24 months~~ |

In accordance with the Surveillance Frequency Control Program

## 3.9 REFUELING OPERATIONS

### 3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required refueling equipment interlocks inoperable. | A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s). | Immediately |
| | OR | |
| | A.2.1 Insert a control rod withdrawal block | Immediately |
| | AND | |
| | A.2.2 Verify all control rods are fully inserted. | Immediately |

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~~<br>In accordance with the Surveillance Frequency Control Program |

## 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><br>Perform CHANNEL FUNCTIONAL TEST. | ~~7 days~~ |

In accordance with the Surveillance Frequency Control Program

## 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

| CONDITIONS | 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~~ |

In accordance with the Surveillance Frequency Control Program

## 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><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~~ |

In accordance with the Surveillance Frequency Control Program

## 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.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. RPV water level not within limit. | A.1 Suspend movement of irradiated fuel assemblies 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~~ |

In accordance with the Surveillance Frequency Control Program

## 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 new 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~~ In accordance with the Surveillance Frequency Control Program |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| 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 3.9.8.1 | Verify one RHR shutdown cooling subsystem is operating. | ~~12 hours~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| 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~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.3.1 | Perform the applicable SRs for the required LCOs. | According to the applicable SRs |
| SR 3.10.3.2 | ----------NOTE----------<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~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. One or more of the above requirements not met with the affected control rod not insertable. | B.1 Suspend withdrawal of the control rod and removal of associated CRD. | Immediately |
| | AND | |
| | B.2.1 Initiate action to fully insert all control rods. | Immediately |
| | OR | |
| | 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----------<br>Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.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>In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| 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----------<br>Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements.<br>----------<br><br>Verify a control rod withdrawal block is inserted. | ~~24 hours~~ |

In accordance with the Surveillance Frequency Control Program

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 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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.5.3 | Verify a control rod withrdrawal 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~~ |

In accordance with the Surveillance Frequency Control Program

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more of the above requirements not met. | A.1 Suspend withdrawal of control rods and removal of associated CRDs. | Immediately |
| | AND | |
| | A.2 Suspend loading fuel assemblies. | Immediately |
| | AND | |
| | 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~~ In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| 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----------<br>Only required to be met during fuel loading.<br>----------<br><br>Verify fuel assemblies being loaded are in compliance with an approved spiral reload sequence. | ~~24 hours~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.8.2 | ----------NOTE----------<br>Not required to be met if SR 3.10.8.3 satisfied.<br>----------<br><br>Perform the MODE 2 applicable SRs for LCO 3.3.2.1, Function 1.b of Table 3.3.2.1-1. | According to the applicable SRs |
| 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~~ |

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.8.5 | Verify each withdrawn control rod does not go to the withdrawn overtravel position. | Each time the control rod is withdrawn to "full out" position<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~~ |

In accordance with the Surveillance Frequency Control Program

## 3.10 SPECIAL OPERATIONS

### 3.10.9 Training Startups

LCO 3.10.9 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. THERMAL POWER is ≤ 1% RTP; 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 3.10.9.1 Verify THERMAL POWER is ≤ 1% RTP. | ~~1 hour~~ |
| SR 3.10.9.2 Verify average reactor coolant temperature is < 200°F. | ~~1 hour~~ |

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.10.10.1 | Verify all control rods other than the control rod being withdrawn, are fully inserted. | ~~24 hours~~ |
| SR 3.10.10.2 | Verify no other CORE ALTERATIONS are in progress. | ~~24 hours~~ |

In accordance with the Surveillance Frequency Control Program

5.5 Program and Manuals

5.5.15 Control Room Envelope Habitability Program (continued)

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one subsystem of the Control Room Ventilation System, operating at the flow rate required by the VFTP, at a Frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as a part of the 24 month assessment of the CRE boundary.

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

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

5.5.16 Surveillance Frequency Control Program

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

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

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

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

**ATTACHMENT 4**
**Markup of Proposed Technical Specifications Bases Pages**

**Clinton Power Station, Unit 1**

**Facility Operating License No. NPF-62**

MARKUP OF PROPOSED TECHNICAL SPECIFICATIONS BASES PAGES
(Note: TS Bases pages are provided for information only.)

| | | | | | |
|---|---|---|---|---|---|
| B 3.1-19 | B 3.3-59 | B 3.3-214 | B 3.5-26 | B 3.6-124 | B 3.8-47 |
| B 3.1-26 | B 3.3-63 | B 3.3-219 | B 3.6-14 | B 3.6-127 | B 3.8-48 |
| B 3.1-32 | B 3.3-64 | B 3.3-220 | B 3.6-22b | B 3.6-131 | B 3.8-56 |
| B 3.1-36 | B 3.3-72 | B 3.3-221 | B 3.6-26 | B 3.6-132 | B 3.8-57 |
| B 3.1-40 | B 3.3-73 | B 3.3-228 | B 3.6-28a | B 3.7-6 | B 3.8-68 |
| B 3.1-41 | B 3.3-74 | B 3.3-229 | B 3.6-31 | B 3.7-6a | B 3.8-68a |
| B 3.1-42 | B 3.3-82 | B 3.3-235 | B 3.6-34 | B 3.7-9 | B 3.8-68b |
| B 3.1-43 | B 3.3-83 | B 3.3-236 | B 3.6-37a | B 3.7-16a | B 3.8-73 |
| B 3.1-47 | B 3.3-84 | B 3.4-7 | B 3.6-42 | B 3.7-16b | B 3.8-77 |
| B 3.1-48 | B 3.3-119 | B 3.4-11 | B 3.6-43 | B 3.7-21 | B 3.8-87 |
| B 3.2-4 | B 3.3-120 | B 3.4-16 | B 3.6-47c | B 3.7-24 | B 3.8-92 |
| B 3.2-8 | B 3.3-120a | B 3.4-21 | B 3.6-52 | B 3.7-24a | B 3.8-96 |
| B 3.2-11 | B 3.3-120b | B 3.4-22 | B 3.6-55 | B 3.7-27 | B 3.8-97 |
| B 3.3.23 | B 3.3-121 | B 3.4-27 | B 3.6-58a | B 3.7-29 | B 3.9-4 |
| B 3.3.24 | B 3.3-132 | B 3.4-27a | B 3.6-63 | B 3.8-13b | B 3.9-7 |
| B 3.3-25 | B 3.3-133 | B 3.4-35 | B 3.6-64 | B 3.8-14 | B 3.9-11 |
| B 3.3-26 | B 3.3-134 | B 3.4-38 | B 3.6-65 | B 3.8-15 | B 3.9-18 |
| B 3.3-27 | B 3.3-170 | B 3.4-42 | B 3.6-76 | B 3.8-16 | B 3.9-21 |
| B 3.3-27a | B 3.3-171 | B 3.4-47 | B 3.6-77 | B 3.8-17 | B 3.9-24 |
| B 3.3-28 | B 3.3-172 | B 3.4-52 | B 3.6-81 | B 3.8-18 | B 3.9-28 |
| B 3.3-29 | B 3.3-173 | B 3.4-58 | B 3.6-82 | B 3.8-19 | B 3.9-32 |
| B 3.3-30 | B 3.3-182 | B 3.4-60 | B 3.6-88 | B 3.8-19b | B 3.10-9 |
| B 3.3-30a | B 3.3-183 | B 3.4-61 | B 3.6-88b | B 3.8-21 | B 3.10-10 |
| B 3.3-36 | B 3.3-184 | B 3.4-63 | B 3.6-94 | B 3.8-22 | B 3.10-14 |
| B 3.3-37 | B 3.3-185 | B 3.5-10 | B 3.6-95 | B 3.8-23 | B 3.10-15 |
| B 3.3-38 | B 3.3-194 | B 3.5-11 | B 3.6-101 | B 3.8-24 | B 3.10-20 |
| B 3.3-39f | B 3.3-195 | B 3.5-12 | B 3.6-101a | B 3.8-25 | B 3.10-25 |
| B 3.3-39g | B 3.3-196 | B 3.5-13 | B 3.6-105 | B 3.8-26 | B 3.10-28 |
| B 3.3-39h | B 3.3-205 | B 3.5-14 | B 3.6-105a | B 3.8-28 | B 3.10-37 |
| B 3.3-39i | B 3.3-206 | B 3.5-14a | B 3.6-105b | B 3.8-29 | B 3.10-38 |
| B 3.3-46 | B 3.3-207 | B 3.5-20 | B 3.6-111 | B 3.8-30 | B 3.10-41 |
| B 3.3-47 | B 3.3-212 | B 3.5-20a | B 3.6-118 | B 3.8-31 | B 3.10-45 |
| B 3.3-48 | B 3.3-213a | B 3.5-24 | B 3.6-119 | B 3.8-32 | B 3.10-46 |
| B 3.3-58 | B 3.3-213b | B 3.5-25 | B 3.6-121 | B 3.8-45 | |

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

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

SR 3.1.3.2

Deleted

SR 3.1.3.3

Control rod insertion capability is demonstrated by inserting each partially or fully withdrawn control rod at least one notch and observing that the control rod moves. The control rod may then be returned to its original position. This ensures the control rod is not stuck and is free to insert on a scram signal. This Surveillance is modified by a note identifying that the Surveillance is not required to be performed when THERMAL POWER is less than or equal to the actual LPSP of the RPCS since the notch insertions may not be compatible with the requirements of BPWS (LCO 3.1.6) and the RPCS (LCO 3.3.2.1). This note also provides a time allowance (i.e., the associated SR Frequency plus the extension allowed by SR 3.0.2) such that the Surveillance is not required to be performed until the next scheduled control rod testing. This note provides this allowance to prevent unnecessary perturbations in reactor operation to perform this testing on a control rod. ~~The 31 day Frequency takes into account operating experience related to changes in CRD performance.~~ At any time, if a control rod is

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

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 7.5% of the control rods in the tested sample are determined to be "slow." If more than 7.5% of the sample is declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 7.5% criterion (i.e., 7.5% of the entire sample size) is satisfied, or until the total number of "slow" control rods throughout the core, from all surveillances) exceed 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 200 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable, based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to scram time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 8).

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 by demonstrating an acceptable scram insertion time to notch position 13. The scram time acceptance criteria for this alternate test shall be determined by linear interpolation between 0.95 seconds at a reactor coolant pressure of 0 psig and 1.40 seconds at 950 psig. The limits for reactor pressures < 950 psig are established based on a high

(continued)

BASES

ACTIONS (continued)

D.1

The reactor mode switch must be immediately placed in the shutdown position if either Required Action and associated Completion Time associated with the loss of the CRD 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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 (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.~~

With regard to accumulator pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 6).

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

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 3.3.2.1.9 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 $\leq$ 16.7% RTP.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 15.0

2. USAR, Section 15.4.9.

3. NUREG-0979, "NRC Safety Evaluation Report Related to the Final Design Approval of the GESSAR II BWR/6 Nuclear Island Design, Docket No. 50-447," Section 4.2.1.3.2, April 1983.

4. NUREG-0800, "Standard Review Plan," Section 15.4.9, "Radiological Consequences of Control Rod Drop Accident (BWR)," Revision 2, July 1981.

5. 10 CFR 100.11, "Determination of Exclusion Area, Low Population Zone, and Population Center Distance."

(continued)

BASES

ACTIONS

A.1 (continued)

remaining OPERABLE subsystem could result in reduced SLC System shutdown capability. The 7 day Completion Time is based on the availability of an OPERABLE subsystem capable of performing the intended SLC System function and the low probability of a Design Basis Accident (DBA) or severe transient occurring concurrent with the failure of the Control Rod Drive System to shut down the plant.

B.1

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

C.1 and C.2

If any Required Action and associated Completion Time is not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to 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 3.1.7.1, 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,~~ verify~~ing~~ certain characteristics of the SLC System (i.e., the volume and temperature of the borated solution in the storage tank, and temperature of the pump suction piping), 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1, SR 3.1.7.2, and SR 3.1.7.3 (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to volume and temperature values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Refs. 3, 4, 5).

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.~~

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. 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.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 solution temperature is restored to ≥ 70°F, 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.~~

With regard to boron concentration values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 6).

SR 3.1.7.7

Demonstrating each SLC System pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1220 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.

Values obtained for flow rate and discharge pressure pursuant to this SR, as read from plant indication instrumentation, are considered to be nominal values and therefore do not require compensation for instrument indication uncertainties (Ref. 7).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

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 48 months, at alternating 24 month intervals.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The Surveillance may be performed in separate steps to prevent injecting boron into the RPV. An acceptable method for verifying flow from the pump to the RPV is to pump demineralized water from a test tank through one SLC subsystem and into the RPV. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance test; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program. If

Demonstrating that all piping between the boron solution storage tank and the suction inlet to the injection pumps is unblocked ensures that there is a functioning flow path for injecting the sodium pentaborate solution. An acceptable method for verifying that the suction piping is unblocked is to pump from the storage tank to the test tank. Following this test, the piping will be drained and flushed with demineralized water. ~~The 24 month Frequency is acceptable since there is a low probability that the subject piping will be blocked due to precipitation of the boron from solution in the piping. 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 to $\geq$ 70°F.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

During normal operation, the SDV vent and drain valves should be in the open position (except when performing SR 3.1.8.2) to allow for drainage of the SDV piping. Verifying that each valve is in the open position ensures that the SDV vent and drain valves will perform their intended 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.1.8.2

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

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, "Control Rod OPERABILITY," overlap this Surveillance to provide complete testing of the assumed safety function. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.3 (continued)

~~the reactor at power. Operating experience has shown these components usually pass the Surveillance; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

With regard to SDV vent and drain valve closing time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

REFERENCES

1. USAR, Section 4.6.1.1.2.4.2.5.

2. 10 CFR 100.

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

4. Calculation IP-0-0017.

BASES

ACTIONS

B.1 (continued)

POWER must be reduced to < 21.6% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 21.6% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

APLHGRs are required to be initially calculated within 12 hours after THERMAL POWER is ≥ 21.6% 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 ≥ 21.6% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels.

periodically

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to APLHGR values obtained pursuant to this SR, as determined from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 6).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

The MCPR is required to be initially calculated within 12 hours after THERMAL POWER is ≥ 21.6% 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 ≥ 21.6% RTP is acceptable given the large inherent margin to operating limits at low power levels.

periodically

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to MCPR values obtained pursuant to this SR, as determined from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 9).

SR 3.2.2.2

Because the transient analyses may take credit for conservatism in the control rod scram speed performance, it must be demonstrated that the specific scram speed distribution is consistent with that used in the transient analyses. SR 3.2.2.2 determines the actual scram speed distribution and compares it with the assumed distribution. The MCPR operating limit is then determined based either on the applicable limit associated with scram times of LCO 3.1.4, "Control Rod Scram Times," or the realistic scram times. The scram time dependent MCPR limits are contained in the COLR. This determination must be preformed and any necessary changes must be implemented with in 72 hours after each set of control rod 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 the actual control rod scram speed distribution expected during the fuel cycle.

(continued)

BASES

LCO (continued)

With only one recirculation loop in operation, in conformance with the requirements of LCO 3.4.1, "Recirculation Loops Operating," the limit is determined by multiplying the exposure dependent LHGR limit by the smaller of either $LHGRFAC_f$, $LHGRFAC_p$, and the LHGR single loop operation multiplier, where the single loop operation multiplier has been determined by a specific single recirculation loop analysis (Refs. 6 and 7).

APPLICABILITY

The LHGR limits are derived from fuel design analysis that is limiting at high power level conditions. At core thermal power levels < 21.6% 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 ≥ 21.6% 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 limit(s) such that the plant is operating within analyzed conditions and within the design limits of the fuel rods. The 2 hour Completion Time is normally sufficient to restore the LHGR(s) to within its limit and is acceptable based on the low probability of a transient occurring simultaneously with the LHGR out of specification.

B.1

If the LHGR cannot be restored to within its required limit 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 < 21.6% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 21.6% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

periodically

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The LHGRs are required to be initially calculated within 12 hours after THERMAL POWER is ≥ 21.6% RTP and ~~then every 24 hours~~ thereafter. They are 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 during normal conditions.~~ The 12 hour allowance after THERMAL POWER ≥ 21.6% RTP is achieved is acceptable given the large inherent margin to operating limits at lower power levels.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance. ~~The Frequency of once per 7 days is based on minor changes in LPRM sensitivity, which could affect the APRM reading between performances of SR 3.3.1.1.8.~~

A restriction to satisfying this SR when < 21.6% RTP is provided that requires the SR to be met only at ≥ 21.6% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 21.6% RTP. At low power levels, a high degree

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.2 (continued)

of accuracy is unnecessary because of the large inherent margin to thermal limits (MCPR and APLHGR). At ≥ 21.6% RTP, the Surveillance is required to have been satisfactorily performed ~~within the last 7 days~~ in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 21.6% 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 21.6% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

With regard to core thermal power values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 11).

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 APRM Function accurately reflects the required setpoint as a function of flow.

~~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 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, 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.4 (continued)

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 availability over the Frequency interval and is based on reliability analysis (Ref. 9).~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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. ~~A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on the reliability analysis of Reference 9.~~

SR 3.3.1.1.6 and SR 3.3.1.1.7

These Surveillances are established to ensure that no gaps in neutron flux indication exist from subcritical to power operation for monitoring core reactivity status.

The overlap between SRMs and IRMs is required to be demonstrated to ensure that reactor power will not be increased into a region without adequate neutron flux indication. This is required prior to withdrawing SRMs from the fully inserted position since indication is being transitioned from the SRMs to the IRMs.

The overlap between IRMs and APRMs is of concern when reducing power into the IRM range. On power increases, the system design will prevent further increases (initiate 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 an APRM downscale rod block or an IRM upscale rod

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.6 and SR 3.3.1.1.7 (continued)

block. Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above the downscale value of 5 and increasing as neutron flux increases, prior to the SRMs indication reaching their upscale limit.

As noted, SR 3.3.1.1.7 is only required to be met during entry into MODE 2 from MODE 1. That is, after the overlap requirement has been met and indication has transitioned to the IRMs, maintaining overlap is not required (APRMs may be reading downscale once in MODE 2).

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

~~A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.8

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 2000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes and the NRC Safety Evaluation documenting approval of License Amendment 181 (Reference 14).~~

SR 3.3.1.1.9 and SR 3.3.1.1.12

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 3.3.1.1.9 is based on the reliability analysis of Reference 9.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.9 and SR 3.3.1.1.12 (continued)

~~The 24 month Frequency for the Reactor Mode Switch - Shutdown Position function 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.~~

~~The 24-month Frequency for the Scram Discharge Volume float switch channel functional test is based on a plant-specific risk analysis documented in Reference 13. This analysis demonstrated that a surveillance test interval of 24 months resulted in a very small increase in core damage frequency and large early release frequency. In addition, this frequency supports optimizing radiological exposures as low as reasonably achievable.~~

SR 3.3.1.1.10

The calibration of analog trip modules 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 92 days for SR 3.3.1.1.10 is based on the reliability analysis of Reference 9.~~

SR 3.3.1.1.11 and SR 3.3.1.1.13

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 SR 3.3.1.1.13 calibration for selected Functions is modified by a Note as identified in Table 3.3.1.1-1. This Note, which applies only to those Functions identified in Table 3.3.1.1-1, is divided into three parts. Part 1 of the Note requires evaluation of instrument performance for the condition where the as-found setting for these instrument channels is outside its As-Found Tolerance (AFT) but conservative with respect to the Allowable Value.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.11 and SR 3.3.1.1.13 (continued)

Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. Initial evaluation will be performed by the technician performing the surveillance who will evaluate the instrument's ability to maintain a stable setpoint within the As-Left Tolerance (ALT). The technician's evaluation will be reviewed by on-shift operations personnel during the approval of the surveillance data. Subsequent to returning the instrument to service, the deviation is entered into the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for operability by on-shift operations personnel. Additional evaluation and potential corrective actions as necessary will ensure that any as-found setting found outside the AFT is evaluated for long-term operability trends. If the as-found channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable. Part 2 of the Note requires that the instrument channel setpoint shall be reset to within the ALT of the Actual Trip Setpoint (ATSP). The ATSP is equivalent to or more conservative than the Nominal Trip Setpoint (NTSP). The NTSP is the limiting value of the sensed process variable at which a trip may be set in accordance with the methodology documented in the ORM. Therefore, the NTSP is equivalent to the Limiting Safety System Setting (LSSS) required by 10 CFR 50.36, "Technical specifications." The Actual Trip Setpoint is also calculated in accordance with the plant-specific setpoint methodology as documented in the CPS ORM and may include additional margin. The ATSP will ensure that sufficient margin to the safety and/or analytical limit is maintained. If the as-left instrument channel setpoint cannot be returned to within the ALT of the Actual Trip Setpoint, then the channel shall be declared inoperable. Part 3 of the Note indicates that the Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the As-Found Tolerance and the As-Left Tolerance bands are specified in the ORM.

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 ~~2000 MWD/T~~ LPRM calibration against the TIPs (SR 3.3.1.1.8). A second Note is provided that requires the APRM and the IRM SRs to be performed within 12 hours of entering MODE 2 from MODE 1.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.11 and SR 3.3.1.1.13 (continued)

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 3.3.1.1.11 and SR 3.3.1.1.13 is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.14

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 is specified in the COLR and must be verified to ensure that the channel is accurately reflecting the desired parameter.

~~The Frequency of 24 months is based on engineering judgment and reliability of the components.~~

With regard to filter time constant values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 11).

SR 3.3.1.1.15

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.15 (continued)

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.16

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 $\geq$ 33.3% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodology are incorporated into the actual setpoint.

If any bypass channel setpoint is nonconservative such that the Functions are bypassed at $\geq$ 33.3% RTP (e.g., due to open main steam line drain(s), 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 24 months is based on engineering judgment and reliability of the components.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.17

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 plant Surveillance procedures.

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time. In addition, for Functions 3, 4, and 5, the associated sensors are not required to be response time tested. For these Functions, response time testing for the remaining channel components, including the ATMs, is required. This allowance is supported by Reference 10. ~~RPS RESPONSE TIME tests are conducted on a 24 month STAGGERED TEST BASIS. Note 3 of SR 3.3.1.1.17 requires STAGGERED TEST BASIS Frequency for each Function to be determined separately based on the four channels as specified in Table 3.3.1.1-1. This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~Therefore, staggered testing results in response time verification of these devices every 24 months. This 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.~~

With regard to RPS RESPONSE TIME values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 12).

(continued)

BASES

REFERENCES

1. USAR, Section 7.2.

2. USAR, Section 5.2.2.

3. USAR, Section 6.3.3.

4. USAR, Chapter 15.

5. USAR, Section 15.4.1.2.

6. NEDO-23842, "Continuous Control Rod Withdrawal in the Startup Range," April 18, 1978.

7. USAR, Section 15.4.9.

8. Letter, P. Check (NRC) to G. Lainas (NRC), "BWR Scram Discharge System Safety Evaluation," December 1, 1980, as attached to NRC Generic Letter dated December 9, 1980.

9. NEDO-30851-P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988.

10. NEDO-32291-A, "System Analyses for Elimination of Selected Response Time Testing Requirements," January 1994.

11. Calculation IP-0-0002.

12. Calculation IP-0-0024.

13. Risk Management Document No. 1073, "Scram Discharge Volume Level Instrument Surveillance Interval Extension Risk Assessment," dated November 17, 2006.

~~14. Letter from U. S. NRC to C. Pardee (AmerGen Energy Company, LLC), "Clinton Power Station (CPS), Unit No. 1 - Issuance of Amendment Re: License Amendment Request to Increase the Interval Between Local Power Range Monitor Calibrations from 1000 Megawatt-Days/Ton (MWD/T) to 2000 MWD/T as Required in CPS Technical Specification Surveillance Requirement 3.3.1.1.8 and 3.3.1.3.2 (TAC No. MD3795)," dated September 12, 2008.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.1 and SR 3.3.1.2.3 (continued)

~~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 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 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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. 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

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.4 (continued)

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. 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.~~

With regard to count rate values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 1).

SR 3.3.1.2.5

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. ~~The 31 day Frequency is based on operating experience and on other Surveillances (such as CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.5 (continued)

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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.2.6

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.~~ 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.

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 ~~24 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

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BASES

SURVEILLANCE REQUIREMENTS (continued)

For the following OPRM instrumentation Surveillances, both OPRM modules are tested, although only one is required to satisfy the Surveillance Requirement.

SR 3.3.1.3.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the channel will perform the intended function. ~~A Frequency of 184 days provides an acceptable level of system average unavailability over the Frequency interval and is based on the reliability of the channel (Reference 7).~~

SR 3.3.1.3.2

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 2000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes and the NRC Safety Evaluation documenting approval of License Amendment 181 (Reference 12).~~

SR 3.3.1.3.3

The CHANNEL CALIBRATION is a complete check of the instrument loop. 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. Calibration of the channel provides a check of the internal reference voltage and the internal processor clock frequency. It also compares the desired trip setpoint with those in the processor memory. Since the OPRM is a digital system, the internal reference voltage and processor clock frequency are, in turn, used to automatically calibrate the internal analog to digital converters. The nominal setpoints for the period based detection algorithm are specified in the Core Operating Limits Report (COLR). As noted, 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 ~~2000 MWD/T~~ LPRM calibration against the TIPs (SR 3.3.1.1.8). SR 3.3.1.1.8 thus also ensures the operability of the OPRM instrumentation.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The nominal setpoints for the OPRM trip function for the period based detection algorithm (PBDA) are specified in the COLR. The PBDA trip setpoints are the number of confirmation counts required to permit a trip signal and the peak to average amplitude required to generate a trip signal.

~~The Frequency of 24 months is based upon the assumption of the magnitude of equipment drift provided by the equipment supplier (Reference 7).~~

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.3.4

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 OPRABILITY," and scram discharge volume (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 OPRM self-test function may be utilized to perform this testing for those components that it is designed to monitor.

~~The 24 month Frequency is based on engineering judgement and reliability of the components. Operating experience has shown these components usually pass the surveillance when performed at the 24 month Frequency.~~

SR 3.3.1.3.5

This SR ensures that trips initiated from the OPRM System will not be inadvertently bypassed when THERMAL POWER is ≥ 25% RTP and recirculation drive flow is ≤ the value corresponding to 60% of rated core flow. This normally involves calibration of the bypass channels. The 25% RTP value is the plant specific value for the enable region, as described in Reference 10.

These values have been conservatively selected so that specific, additional uncertainty allowances need not be applied. Specifically, for the THERMAL POWER, the Average Power Range Monitor (APRM) establishes the reference signal to enable the OPRM System at 25% RTP. Thus, the nominal setpoints corresponding to the values listed above (25% RTP and the value corresponding to 60% of rated core flow) will be used to establish the enabled region of the OPRM System trips. (References 1, 2, 6, 10, and 11)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 24 months is based on engineering judgement, high reliability of the components, and operating experience.~~

SR 3.3.1.3.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis (Reference 6). The OPRM self-test function may be utilized to perform this testing for those components it is designed to monitor. The RPS RESPONSE TIME acceptance criteria are included in plant Surveillance procedures.

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3.6 (continued)

virtually ensure an instantaneous response time. ~~RPS RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. This Frequency is consistent with the refueling cycle and is based upon operating experience, which shows that random failures of instrumentation components causing serious time degradation, but not channel failure, are infrequent.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

REFERENCES

1. NEDO-31960, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," June 1991.

2. NEDO-31960, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," Supplement 1, March 1992.

3. NRC Letter, A. Thadani to L. A. England, "Acceptance for Referencing of Topical Reports NEDO-31960, Supplement 1, 'BWR Owners' Group Long-Term Stability Solutions Licensing Methodology'," July 12, 1994.

4. Generic Letter 94-02, "Long-Term Solutions and Upgrade of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in Boiling Water Reactors," July 11, 1994.

5. BWROG Letter BWROG-94079, "Guidelines for Stability Interim Corrective Action," June 6, 1994.

6. NEDO-32465-A, "BWR Owners' Group Reactor Stability Detect and Suppress Solution Licensing Basis Methodology and reload Application," August 1996.

7. CENPD-400-P, Rev. 01, "Generic Topical Report for the ABB Option III Oscillation Power Range Monitor (OPRM)," May 1995.

8. NRC Letter, B. Boger to R. Pinelli, "Acceptance of Licensing Topical Report CENPD-400-P, 'Generic Topical Report for the ABB Option III Oscillation Power Range Monitor (OPRM)'," August 16, 1995.

9. NEDO-30851-P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988.

10. NEDC-32989P, "Safety Analysis Report for Clinton Power Station Extended Power Uprate," dated June 2001.

11. Letter from K. P. Donovan (BWR Owners' Group) to U. S. NRC, "Guidelines for Stability Option III 'Enabled Region'," dated September 17, 1996.

~~12. Letter from U. S. NRC to C. Pardee (AmerGen Energy Company, LLC), "Clinton Power Station (CPS), Unit No. 1 - Issuance of Amendment Re: License Amendment Request to Increase the Interval Between Local Power Range Monitor Calibrations from 1000 Megawatt-Days/Ton (MWD/T) to 2000 MWD/T as Required in CPS Technical Specification Surveillance Requirement 3.3.1.1.8 and 3.3.1.3.2 (TAC No. MD3795)," dated September 12, 2008.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. SR 3.3.2.1.1 verifies proper operation of the two-notch withdrawal limit of the RWL and SR 3.3.2.1.2 verifies proper operation of the four-notch withdrawal limit of the RWL. SR 3.3.2.1.3 and SR 3.3.2.1.4 verify proper operation of the RPC. 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 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. 6).~~

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 such that the RPC is bypassed at ≤ 16.7% RTP, then the RPC is considered inoperable. Similarly, if the LPSP is nonconservative such that the RWL low power Function is bypassed at > 29.2% RTP, (e.g., due to open main steam line drain(s), main turbine bypass valve(s), or other reasons), then the RWL is 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 92 days is based on the setpoint methodology utilized for these channels.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.6

This SR ensures the high power function of the RWL is not bypassed when power is > 70% RTP. The power level is inferred from turbine first stage pressure signals.

Periodic testing of the HPSP channels is required to verify the HPSP to be less than or equal to the limit. This involves calibration of the HPSP. Adequate margins in accordance with setpoint methodologies are included.

If the HPSP is nonconservative such that the RWL high power Function is bypassed at > 70% RTP, (e.g., due to open main steam line drain(s), main turbine bypass valve(s), or other reasons), 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.

~~The Frequency of 92 days is based on the setpoint methodology utilized for these channels.~~

SR 3.3.2.1.7

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

~~The Frequency is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.~~

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.8 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 ~~24 month~~ Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

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. Individual control rods may also be required to be bypassed to allow continuous withdrawal for determining the location of leaking fuel assemblies or adjustment of control rod speed. 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 is in conformance with applicable analyses. Compliance with this SR allows the RPC and RWL to be OPERABLE with these control rods bypassed.

REFERENCES

1. USAR, Section 7.6.1.7.

2. USAR, Section 15.4.2.

3. NEDE-24011-P-A, "General Electric Standard Application for Reload Fuel" (latest approved revision).

(continued)

BASES

ACTIONS

F.1 (continued)

installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels. The Special Report shall be submitted in accordance with 10 CFR 50.4 within 14 days of entering Condition F.

SURVEILLANCE REQUIREMENTS

The following SRs apply to each PAM instrumentation Function in Table 3.3.3.1-1, except as noted below.

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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.1.2 (Deleted)

SR 3.3.3.1.3

~~For all Functions a CHANNEL CALIBRATION is performed every 24 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The CHANNEL CALIBRATION of the Primary Containment and Drywell Area Radiation Functions consists of an electronic calibration of the channel, not including the detector, for range decades above 10 R per hour and a one point calibration check of the detector below 10 R per hour with an installed or portable gamma source.

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," Revision 3, May 1983.

2. SSER 5, Section 7.5.3.1.

3. USAR, Table 7.1-13.

4. USAR Section 7.5.1.4.2.4.

BASES

ACTIONS (continued)

A.1

Condition A addresses the situation where one or more required Functions of the Remote Shutdown System is inoperable. This includes the control and transfer switches for any required Function.

The Required Action is to restore the Function (both divisions, if applicable) to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.3.3.2.1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.2.1 (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 and the local control stations are 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.~~

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 24 month Frequency is based upon operating experience and is consistent with the typical industry refueling cycle.~~

REFERENCES

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

2. Operational Requirements Manual, Attachment 1.

3. NUREG-0853, "Safety Evaluation Report Related to the Operation of Clinton Power Station, Unit No. 1," Supplement No. 6, July 1986, Section 7.4.3.1.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains EOC-RPT trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 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 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. 6).~~

SR 3.3.4.1.2

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.1.3

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 channels would also be inoperable.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance test.~~

SR 3.3.4.1.4

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 ≥ 33.3% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. If any bypass channel's setpoint is nonconservative such that the Functions are bypassed at ≥ 33.3% RTP (e.g., due to open main steam line drain(s), main turbine bypass valve(s) or other reasons), the affected TSV Closure and TCV Fast Closure, Trip Oil Pressure-Low Functions are considered

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1.4 (continued)

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.

~~The Frequency of 24 months has shown that channel bypass failures between successive tests are rare.~~

SR 3.3.4.1.5

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 applicable plant procedures and include an assumed RPT breaker interruption time of 80 milliseconds. This assumed RPT breaker interruption time is validated by the performance of periodic mechanical timing checks, contact wipe and erosion checks, and high potential tests on each breaker in accordance with plant procedures at least once per 48 months. The acceptance criterion for the RPT breaker mechanical timing check shall be ≤ 41 milliseconds (for trip coil TC2).

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~EOC-RPT SYSTEM RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. The Note requires STAGGERED TEST BASIS Frequency to be determined on a per Function basis. This is accomplished by testing all channels of one Function every 24 months on an alternating basis such that both Functions are tested every 48 months. This Frequency is based on the logic interrelationships of the various channels required to produce an EOC-RPT signal. Response times cannot be determined at power because operation of final actuated devices is required. Therefore, this 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.~~

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

~~The Frequency is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 7.7.1.25.2

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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. For series Functions, a separate CHANNEL FUNCTIONAL TEST is not required for each Function, provided each Function is tested. 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.2 (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 4.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.1.3

The calibration of ATMs 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 SR 3.3.5.1.3 calibration for selected Functions is modified by a Note as identified in Table 3.3.5.1-1. This Note, which applies only to those Functions identified in Table 3.3.5.1-1, is divided into three parts. Part 1 of the Note requires evaluation of instrument performance for the condition where the as-found setting for these instrument channels is outside its As-Found Tolerance (AFT) but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. Initial evaluation will be performed by the technician performing the surveillance who will evaluate the instrument's ability to maintain a stable setpoint within the As-Left Tolerance (ALT). The technician's evaluation will be reviewed by on-shift operations personnel during the approval of the surveillance data. Subsequent to returning the instrument to service, the deviation is entered into the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for operability by on-shift operations personnel. Additional evaluation and potential corrective actions as necessary will ensure that any as-found setting found outside the AFT is evaluated for long-term operability trends. If the as-found channel setpoint is not conservative with respect to the Allowable Value, the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.3 (continued)

channel shall be declared inoperable. Part 2 of the Note requires that the instrument channel setpoint shall be reset to within the ALT of the Actual Trip Setpoint (ATSP). The ATSP is equivalent to or more conservative than the Nominal Trip Setpoint (NTSP). The NTSP is the limiting value of the sensed process variable at which a trip may be set in accordance with the methodology documented in the ORM. Therefore, the NTSP is equivalent to the Limiting Safety System Setting (LSSS) required by 10 CFR 50.36, "Technical specifications." The Actual Trip Setpoint is also calculated in accordance with the plant-specific setpoint methodology as documented in the CPS ORM and may include additional margin. The ATSP will ensure that sufficient margin to the safety and/or analytical limit is maintained. If the as-left instrument channel setpoint cannot be returned to within the ALT of the Actual Trip Setpoint, then the channel shall be declared inoperable. Part 3 of the Note indicates that the Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the As-Found Tolerance and the As-Left Tolerance bands are specified in the ORM.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 92 days is based on the reliability analysis of Reference 4.~~

SR 3.3.5.1.4 and SR 3.3.5.1.6

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.

The SR 3.3.5.1.4 and SR 3.3.5.1.6 calibrations for selected Functions are modified by a Note as identified in Table 3.3.5.1-1. This Note, which applies only to those Functions identified in Table 3.3.5.1-1, is divided into three parts. Part 1 of the Note requires evaluation of instrument performance for the condition where the as-found setting for these instrument channels is outside its As-Found Tolerance (AFT) but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. Initial evaluation will be performed by the technician performing the surveillance who will evaluate the instrument's ability to maintain a stable setpoint within the As-Left Tolerance (ALT). The technician's evaluation will be reviewed by on-shift operations personnel during the approval of the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.4 and SR 3.3.5.1.6 (continued)

surveillance data. Subsequent to returning the instrument to service, the deviation is entered into the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for operability by on-shift operations personnel. Additional evaluation and potential corrective actions as necessary will ensure that any as-found setting found outside the AFT is evaluated for long-term operability trends. If the as-found channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable. Part 2 of the Note requires that the instrument channel setpoint shall be reset to within the ALT of the Actual Trip Setpoint (ATSP). The ATSP is equivalent to or more conservative than the Nominal Trip Setpoint (NTSP). The NTSP is the limiting value of the sensed process variable at which a trip may be set in accordance with the methodology documented in the ORM. Therefore, the NTSP is equivalent to the Limiting Safety System Setting (LSSS) required by 10 CFR 50.36, "Technical specifications." The Actual Trip Setpoint is also calculated in accordance with the plant-specific setpoint methodology as documented in the CPS ORM and may include additional margin. The ATSP will ensure that sufficient margin to the safety and/or analytical limit is maintained. If the as-left instrument channel setpoint cannot be returned to within the ALT of the Actual Trip Setpoint, then the channel shall be declared inoperable. Part 3 of the Note indicates that the Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the As-Found Tolerance and the As-Left Tolerance bands are specified in the ORM.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequencies are based upon the assumption of the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.1, LCO 3.5.2, LCO 3.7.2, LCO 3.8.1, and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety function.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~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 unplanned transients if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 5.2.2.

2. USAR, Section 6.3.

3. USAR, Chapter 15.

4. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988.

BASES

SURVEILLANCE REQUIREMENTS (continued)

(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. 2) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2.2 (continued)

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.~~

SR 3.3.5.2.3

The calibration of analog trip modules 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

SR 3.3.5.2.4 and SR 3.3.5.2.6

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 Frequencies are based on the assumption of the magnitude of equipment drift in the setpoint analysis.~~

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2.5 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 15.4.9.

2. 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.

3. USAR, Section 5.4.6.

BASES (continued)

SURVEILLANCE REQUIREMENTS

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

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 isolation capability. Isolation capability may be maintained by ensuring that a sufficient number or arrangement of channels is maintained OPERABLE to effect the trip function, or by maintaining the affected primary containment and drywell isolation valves closed during performance of the surveillance. 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 isolation valves 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.1 (continued)

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 3.3.6.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. For series Functions, a separate CHANNEL FUNCTIONAL TEST is not required for each Function, provided each Function is tested. 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 analog trip modules 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

SR 3.3.6.1.4, SR 3.3.6.1.5, and SR 3.3.6.1.8

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.4, SR 3.3.6.1.5, and SR 3.3.6.1.8 (continued)

responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequencies of SR 3.3.6.1.4, SR 3.3.6.1.5, and SR 3.3.6.1.8 are based on the assumption of the~~ magnitude of equipment drift in the setpoint analysis.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 and on drywell isolation valves in LCO 3.6.5.3 overlaps this Surveillance to provide complete testing of the assumed safety function. (Likewise, system functional testing performed pursuant to LCO 3.7.1 overlaps this Surveillance to provide complete testing for verifying automatic actuation capability for the Division 1 and 2 SX subsystems.) ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.7 (continued)

diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the 12 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 MSIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in applicable plant procedures.

As noted, the associated sensors are not required to be response time tested. Response time testing for the remaining channel components, including the ATMs, is required. This is supported by Reference 7.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~Note 2 to SR 3.3.6.1.7 requires the STAGGERED TEST BASIS Frequency for each Function to be determined seperately based on the number of channels as specified on Table 3.3.6.1-1. This Frequency is based on the logic interrelationships of the various channels required to produce an isolation signal.~~

~~ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. This 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.~~

With regard to ISOLATION SYSTEM RESPONSE TIME values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 8).

REFERENCES

1. USAR, Section 6.2.

2. USAR, Chapter 15.

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

4. USAR, Section 9.3.5.

(continued)

BASES

ACTIONS

C.1.1, C.1.2, C.2.1, and C.2.2 (continued)

Alternatively, declaring the associated SCID(s) or SGT subsystem 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 challenging plant systems.

SURVEILLANCE REQUIREMENTS

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 SCIDs will isolate the associated penetration flow paths and 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 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.1 (continued)

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 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 92 days is based upon the reliability analysis of References 3 and 4.~~

SR 3.3.6.2.3

Calibration of analog trip modules 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.3 (continued)

~~The Frequency of 92 days is based on the reliability analysis of References 3 and 4.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.2.4 and SR 3.3.6.2.6

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

~~The Frequencies are based upon the assumption 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 SCIDs and the SGT System in LCO 3.6.4.2 and LCO 3.6.4.3, respectively, overlaps this Surveillance to provide complete testing of the assumed safety function.

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.5 (continued)

~~Operating experience has shown these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 6.2.3.

2. USAR, Chapter 15.

3. NEDO-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. USAR, Section 7.3.1.1.2.

6. USAR, Section 7.1.2.1.11.

7. USAR, Section 7.3.1.1.9.2.

8. USAR, Section 7.6.1.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RHR containment spray 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 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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. For Series Functions, a separate CHANNEL FUNCTIONAL TEST is not required for each Function, provided each Function is tested. 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 Reference 3.~~

SR 3.3.6.3.3

The calibration of analog trip modules 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 92 days is based upon the reliability analysis of Reference 3.~~

SR 3.3.6.3.4 and SR 3.3.6.3.6

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 Frequencies are based on the assumption of the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.3.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.6.1.7, "Residual Heat Removal (RHR) Containment Spray," overlaps this Surveillance to provide complete testing of the assumed safety function.

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 7.3.1.1.4.

2. USAR, 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.

BASES (continued)

SURVEILLANCE REQUIREMENTS

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 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 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. For Series Functions, a separate CHANNEL FUNCTIONAL TEST is not required for each Function, provided each Function is tested. 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.~~

SR 3.3.6.4.3 and SR 3.3.6.4.4

The calibration of analog trip modules and analog comparator 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

SR 3.3.6.4.5, SR 3.3.6.4.6, and SR 3.3.6.4.8

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.4.5, SR 3.3.6.4.6, and SR 3.3.6.4.8 (continued)

~~The Frequencies are based on the assumption of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.6.4.7

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 7.3.1.1.10

2. USAR, Section 6.2.7.

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

BASES

ACTIONS (continued)

B.1 and B.2

If the inoperable trip system is not restored to OPERABLE status within 7 days, per Condition A, or if two trip systems are inoperable, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 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

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 relief or LLS initiation capability, as applicable. 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 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.3.6.5.2 (continued)

If the as-left instrument channel setpoint cannot be returned to within the ALT of the Actual Trip Setpoint, then the channel shall be declared inoperable. Part 3 of the Note indicates that the Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the As-Found Tolerance and the As-Left Tolerance bands are specified in the ORM.

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

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 SR 3.3.6.5.3 calibration is modified by a Note. This Note is divided into three parts. Part 1 of the Note requires evaluation of instrument performance for the condition where the as-found setting for these instrument channels is outside its As-Found Tolerance (AFT) but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. Initial evaluation will be performed by the technician performing the surveillance who will evaluate the instrument's ability to maintain a stable setpoint within the As-Left Tolerance (ALT). The technician's evaluation will be reviewed by on-shift operations personnel during the approval of the surveillance data. Subsequent to returning the instrument to service, the deviation is entered into the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for operability by on-shift operations personnel. Additional evaluation and potential corrective actions as necessary will ensure that any as-found setting found outside the AFT is evaluated for long-term operability trends. If the as-found channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable. Part 2 of the Note requires that the instrument channel setpoint shall be reset to within the ALT of the Actual Trip Setpoint (ATSP). The ATSP is equivalent to or more conservative than the Nominal

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.5.3 (continued)

Trip Setpoint (NTSP). The NTSP is the limiting value of the sensed process variable at which a trip may be set in accordance with the methodology documented in the ORM. Therefore, the NTSP is equivalent to the Limiting Safety System Setting (LSSS) required by 10 CFR 50.36, "Technical specifications." The Actual Trip Setpoint is also calculated in accordance with the plant-specific setpoint methodology as documented in the CPS ORM and may include additional margin. The ATSP will ensure that sufficient margin to the safety and/or analytical limit is maintained. If the as-left instrument channel setpoint cannot be returned to within the ALT of the Actual Trip Setpoint, then the channel shall be declared inoperable. Part 3 of the Note indicates that the Nominal Trip Setpoint and the methodology used to determine the Nominal Trip Setpoint, the As-Found Tolerance and the As-Left Tolerance bands are specified in the ORM.

~~The Frequency is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 Self Test System may be utilized to perform this testing for those components that it is designed to monitor. ~~Those portions of the solid-state logic not monitored by the Self Test System may be tested at the frequency recommended by the manufacturer, rather than at the specified 24-month~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.5.4 (continued)

~~Frequency. The frequencies recommended by the manufacturer are based on mean time between failure analysis for the components in the associated circuits.~~

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 5.2.2.

2. USAR, Section 7.3.1.1.1.4.2.

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.

BASES

ACTIONS (continued)

B.1 and B.2

With any Required Action and associated Completion Time not met, one CRV subsystem must be placed in the high radiation mode of operation (Required Action B.1) to ensure that control room personnel will be protected in the event of a Design Basis Accident. The method used to place the CRV subsystem in operation must provide for automatically reinitiating the subsystem upon restoration of power following a loss of power to the CRV subsystem(s). Alternately, if it is not desired to start the subsystem in the high radiation mode, the CRV subsystem associated with inoperable, untripped channels must be declared inoperable within 1 hour.

The 1 hour Completion Time is intended to allow the operator time to place the CRV subsystem in operation. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels, or for placing the associated CRV subsystem in operation.

SURVEILLANCE REQUIREMENTS

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

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 CRV System high radiation mode 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 and 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 CRV 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1.1 (continued)

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.

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 92 days is based on the reliability analyses of References 4, 5, and 6.~~

SR 3.3.7.1.3

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1.3 (continued)

adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

~~The Frequency is based on the assumption of the magnitude of equipment drift in the setpoint analysis.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 7.3.1.1.6.

2. USAR, Section 6.4.

3. USAR, 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. USAR, Section 7.6.1.2.5.

7. USAR, Section 7.6.2.2.5.

BASES

ACTIONS (continued)

B.1

If any Required Action and associated Completion Time is not met, the associated Function may not be capable of performing the intended function. Therefore, the associated DG(s) are declared inoperable immediately. This requires entry into applicable Conditions and Required Actions of LCO 3.8.1 and LCO 3.8.2, which provide appropriate actions for the inoperable DG(s).

SURVEILLANCE REQUIREMENTS

As noted 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

This SR has been deleted.

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. For series Functions, i.e., for the degraded voltage relays in series with their associated delay timers, a separate CHANNEL FUNCTIONAL TEST is not required for each Function, provided each Function is tested. 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 that demonstrates that failure in any 31 day interval is rare.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

~~The Frequency is based on the assumption of the magnitude of equipment drift in the setpoint analysis.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance.~~

REFERENCES

1. USAR, Section 8.3.1.1.2.

2. USAR, Section 5.2.2.

3. USAR, Section 6.3.3.

4. USAR, Chapter 15.

5. IP Calculation 19-AN-19.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.1 (continued)

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~~ is based on guidance provided in Generic Letter 91-09 (Ref. 3).

SR 3.3.8.2.2

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 a 24 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.3 (continued)

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 8.3.1.1.3.1.

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

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

BASES

ACTIONS (continued)

D.1

With no recirculation loops in operation, or the Required Action and associated Completion Time of Conditions A, B, or C not met, the unit is required to be brought to a MODE in which the LCO does not apply. The plant is required to be placed in MODE 3 in 12 hours. In this condition, the recirculation loops are not required to be operating because of the reduced severity of DBAs and minimal dependence on the recirculation loop coastdown characteristics. 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 3.4.1.1

This SR ensures the recirculation loop flows are within the allowable limits for mismatch. At low core flow (i.e., < 70% of rated core flow), the MCPR requirements provide larger margins to the fuel cladding integrity Safety Limit such that the potential adverse effect of early boiling transition during a LOCA is reduced. A larger flow mismatch can therefore be allowed when core flow is < 70% of rated core flow. The recirculation loop jet pump flow, as used in this Surveillance, is the summation of the flows from all of the jet pumps associated with a single recirculation loop.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The mismatch is measured in terms of percent of rated core flow. 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.~~

With regard to recirculation loop flow values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

(continued)

BASES

ACTIONS (continued)

B.1

If the FCVs are not deactivated, (locked up) and 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 unit must be brought to at least MODE 3 within 12 hours. This brings the unit to a condition where the flow coastdown characteristics of the recirculation loop are not important. 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 unit systems.

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 as assumed in the design basis LOCA analyses.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the SR. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1 (continued)

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.~~

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.

Note 2 allows this SR not to be performed when THERMAL POWER is ≤ 21.6% RTP. During low flow conditions, jet pump noise approaches the threshold response of the associated flow instrumentation and precludes the collection of repeatable and meaningful data.

With regard to drive flow and differential pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.4.2 (continued)

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the SR. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

SR 3.4.4.3

A manual actuation of each required S/RV (those valves removed and replaced to satisfy SR 3.4.4.1) is performed to verify that the valve is functioning properly. This SR can be demonstrated by one of two methods. If performed by Method 1, plant startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements (Ref. 6), 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 performed by Method 2, valve OPERABILITY has been demonstrated for all installed S/RVs based upon the successful operation of a test sample of S/RVs.

1. Manual actuation of the S/RV with verification of 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 (e.g., tailpipe temperature or acoustic monitoring). Adequate reactor steam pressure must be available to perform this test to avoid damaging the valve. Also, adequate 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 consistent with the pressure recommended by the valve manufacturer.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.4.3 (continued)

2. The sample population of S/RVs tested to satisfy SR 3.4.4.1 will also be stroked in the relief mode during "as-found" testing to verify proper operation of the S/RV. The successful performance of the test sample of S/RVs provides reasonable assurance that the remaining installed S/RVs will perform in a similar fashion. After the S/RVs are replaced, the relief-mode actuator of the newly-installed S/RVs will be uncoupled from the S/RV stem, and cycled to ensure that no damage has occurred to the S/RV during transportation and installation. Following cycling, the relief-mode actuator is recoupled and the proper positioning of the stem nut is independently verified.

This verifies that each replaced S/RV will properly perform its intended function. 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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 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. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. ASME, Boiler and Pressure Vessel Code, Section III and XI.

2. USAR, Section 5.2.2.

3. USAR, Section 15.

4. NEDC-32202P, "SRV Setpoint Tolerance and Out-of-Service Analysis for Clinton Power Station, "August 1993."

5. Calculation IP-0-0032.

6. ASME/ANSI OM-1987, Operation and Maintenance of Nuclear Power Plants, Part 1.

BASES

ACTIONS

C.1 and C.2 (continued)

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

The RCS LEAKAGE is monitored by a variety of instruments designed 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, a 12 hour Frequency for this Surveillance is appropriate for identifying changes in LEAKAGE and for tracking required trends (Ref. 8).~~

With regard to LEAKAGE values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. ~~9~~ 8).

BASES

REFERENCES

1. 10 CFR 50.2.

2. 10 CFR 50.55a(c).

3. 10 CFR 50, Appendix A, GDC 55.

4. GEAP-5620, "Failure Behavior in ASTM A106B Pipes Containing Axial Through——Wall Flaws," April 1968.

5. NUREG-75/067, "Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping of Boiling Water Reactor Plants," October 1975.

6. USAR, Section 5.2.5.5.3.

7. Regulatory Guide 1.45, May 1973.

8. ~~Generic Letter 88-01, Supplement 1, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," February 1992.~~

~~9.~~ Calculation IP-0-0033.

BASES

APPLICABLE SAFETY ANALYSES (continued)

and 5). Each of the leakage detection systems inside the drywell is designed with the capability of detecting LEAKAGE less than the established LEAKAGE rate limits.

Identification of the LEAKAGE allows the operators to evaluate the significance of the indicated LEAKAGE and, if necessary, shut down the reactor for further investigation and corrective action. The allowed LEAKAGE rates are well below the rates predicted for critical crack sizes (Ref. 6).

Therefore, these actions provide adequate response before a significant break in the RCPB can occur.

RCS leakage detection instrumentation satisfies Criterion 1 of the NRC Policy Statement.

LCO

The drywell floor drain sump flow monitoring system is required to quantify the unidentified LEAKAGE from the RCS. Thus, for the system to be considered OPERABLE, either the sump level rate of change, or the sump pump discharge flow monitoring portion of the system must be OPERABLE. The other monitoring systems provide qualitative indication to the operators so closer examination of other detection systems will be made to determine the extent of any corrective action that may be required. With the leakage detection systems inoperable, monitoring for LEAKAGE in the RCPB is degraded.

APPLICABILITY

In MODES 1, 2, and 3, leakage detection systems are required to be OPERABLE to support LCO 3.4.5. This Applicability is consistent with that for LCO 3.4.5.

ACTIONS

A.1

With both drywell floor drain sump flow monitoring systems inoperable, no other form of sampling can provide the equivalent information to quantify leakage. However, the drywell atmospheric activity monitor and the drywell air cooler condensate flow rate monitor will provide indications of changes in leakage.

With both drywell floor drain sump monitoring systems inoperable, but with RCS unidentified and total LEAKAGE being determined ~~every 12 hours~~ (SR 3.4.5.1), operation may

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1 (continued)

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 relative accuracy of the instrumentation. 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 instrumentation, including the instruments located inside the drywell. ~~The Frequency of 24 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.

3. USAR, Section 5.2.5.2.2.

4. GEAP-5620, "Failure Behavior in ASTM A106B Pipes Containing Axial Through—Wall Flaws," April 1968.

5. NUREG-75/067, "Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping of Boiling Water Reactor Plants," October 1975.

6. USAR, Section 5.2.5.5.3.

7. USAR, Section 5.2.5.9.

BASES (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

With regard to specific activity values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

REFERENCES

1. 10 CFR 100.11.

2. USAR, Section 15.6.4.

3. Calculation IP-0-0035.

BASES

ACTIONS

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

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

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

REFERENCES

1. USAR, Section 5.4.7.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1 (continued)

decay heat removal capability. ~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 5.4.7.

BASES

ACTIONS (continued)

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

periodically

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

Verification that operation is within limits is required ~~every 30 minutes~~ when RCS pressure and temperature conditions are undergoing planned changes. ~~This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature rate of change limits are specified in hourly increments, 30 minutes permits assessment and correction of minor deviations.~~

Surveillance for heatup, cooldown, or inservice leakage and hydrostatic testing may be discontinued when the criteria given in the relevant plant procedure for ending the activity are satisfied.

This SR has been modified by a Note that requires this Surveillance to be performed only during system heatup and cooldown operations and inservice leakage and hydrostatic testing.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.11.3 and SR 3.4.11.4 (continued)

An acceptable means of demonstrating compliance with the temperature differential requirement in SR 3.4.11.4 is to compare the temperatures of the operating recirculation loop and the idle loop.

SR 3.4.11.3 and SR 3.4.11.4 have been modified by a Note that requires the Surveillance to be met only in MODES 1, 2, 3, and 4 during recirculation pump start. In MODE 5, the overall stress on limiting components is lower; therefore, $\Delta T$ limits are not required.

With regard to temperature difference values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Refs. 13, 14).

SR 3.4.11.5, SR 3.4.11.6, and SR 3.4.11.7

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

The flange temperatures must be verified to be above the limits ~~30 minutes~~ before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. SR 3.4.11.5 allows up to 10% of the reactor vessel head bolting studs to be fully tensioned with flange temperatures < 70 °F. This allows the closure flange O-rings to be sealed to support raising reactor water level to assist in warming the flanges. 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 ≤ 90°F, monitoring of the flange temperature is required ~~every 12 hours~~ to ensure the temperatures are within limits.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.11.5, SR 3.4.11.6, and SR 3.4.11.7 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

With regard to reactor vessel flange and head flange temperature values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 15).

SR 3.4.11.8 and SR 3.4.11.9

Differential temperatures within the applicable limits ensure that thermal stresses resulting from increases in THERMAL POWER or recirculation loop flow during single recirculation loop operation will not exceed design allowances. Performing the Surveillance within 15 minutes before beginning such an increase in power or flow rate provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the change in operation.

An acceptable means of demonstrating compliance with the temperature differential requirement in SR 3.4.11.9 is to compare the temperatures of the operating recirculation loop and the idle loop.

Plant specific test data has determined that the bottom head is not subject to temperature stratification with natural circulation at power levels as low as 25% of RTP and with any single loop flow rate greater than or equal to 30% of rated loop flow. Therefore, SR 3.4.11.8 and SR 3.4.11.9 have been modified by a Note that requires the Surveillance to be met only when THERMAL POWER or loop flow is being increased when the above conditions are not met. The Note for SR 3.4.11.9 further limits the requirement for this Surveillance to exclude comparison of the idle loop temperature if the idle loop is isolated from the RPV since the water in the loop cannot be introduced into the remainder of the Reactor Coolant System.

(continued)

BASES

APPLICABILITY (continued)

In MODES 3, 4, and 5, the limit is not applicable because the reactor is shut down. In these MODES, the reactor pressure is well below the required limit, and no anticipated events will challenge the overpressure limits.

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.

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 vessel overpressure protection analysis are met. ~~Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to reactor steam dome pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

BASES (continued)

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

This SR is modified by a Note that allows LPCI subsystems to be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the RHR cut in permissive pressure in MODE 3, if capable of being manually realigned (remote or local) to the LPCI mode and not otherwise inoperable. This allows operation in the RHR shutdown cooling mode during MODE 3 if necessary.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.3

Verification ~~every 31 days~~ that ADS accumulator supply pressure is ≥ 140 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. 15). 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 140 psig is provided by the Instrument Air System. ~~The 31 day Frequency takes into consideration administrative control over operation of the Instrument Air System and alarms for low air pressure.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to ADS accumulator supply pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 17).

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 with a pump differential pressure that is sufficient to overcome the RPV pressure expected during a LOCA. The 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. The Frequency for this Surveillance is in accordance with the Inservice Testing Program requirements.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.4 (continued)

With regard to pump flow rates and differential pressures values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Refs. 18, 19, 20).

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 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 RCIC storage tank to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," overlaps this Surveillance to provide complete testing of the assumed safety function.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.5 (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 3.5.1.6

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

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

SR 3.5.1.7

A manual actuation of each required ADS valve (those valves removed and replaced to satisfy SR 3.4.4.1) is performed to verify that the valve is functioning properly. This SR can be demonstrated by one of two methods. If performed by Method 1, plant startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements (Ref. 22), 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.7 (continued)

Conditions for testing and provides a reasonable time to complete the SR. If performed by Method 2, valve OPERABILITY has been demonstrated for all installed ADS valves based upon the successful operations of a test sample of S/RVs.

1. Manual actuation of the ADS valve, with verification of 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 (e.g., tailpipe temperature or acoustic monitoring). Adequate reactor steam 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 consistent with the pressure recommended by the valve manufacturer.

2. The sample population of S/RVs tested to satisfy SR 3.4.4.1 will also be stroked in the relief mode during "as-found" testing to verify proper operation of the S/RV. The successful performance of the test sample of S/RVs provides reasonable assurance that all ADS valves will perform in a similar fashion. After the S/RVs are replaced, the relief-mode actuator of the newly-installed S/RVs will be uncoupled from the S/RV stem, and cycled to ensure that no damage has occurred to the S/RV during transportation and installation. Following cycling, the relief-mode actuator is recoupled and the proper positioning of the stem nut is independently verified. This verifies that each replaced S/RV will properly perform its intended function.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 STAGGERED TEST BASIS Frequency ensures that both solenoids for each ADS valve relief-mode actuator are alternately tested. The Frequency of the required relief-mode actuator testing is based on the tests required by ASME OM, Part 1, (Ref. 22) as implemented by the Inservice Testing Program of Specification 5.5.6. The testing Frequency required by the Inservice Testing Program is based on operating experience and valve performance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.8

This SR ensures that the ECCS RESPONSE TIMES are within limits for each of the ECCS injection and spray subsystems. The response time limits (i.e., ≤42 seconds for the LPCI subsystems, ≤41 seconds for the LPCS subsystem, and ≤27 seconds for the HPCS system) are specified in applicable surveillance test procedures. This SR is modified by a Note which identifies that the associated ECCS actuation instrumentation is not required to be response time tested. This is supported by Reference 16.

Response time testing of the remaining subsystem components is required. However, of the remaining subsystem components, the time for each ECCS pump to reach rated speed is not directly measured in the response time tests. The time(s) for the ECCS pumps to reach rated speed is bounded, in all cases, by the time(s) for the ECCS injection valve(s) to reach the full-open position. Plant-specific calculations show that all ECCS motor start times at rated voltage are less than two seconds. In addition, these calculations show that under degraded voltage conditions, the time to rated speed is less than five seconds.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~ECCS RESPONSE TIME tests are conducted 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 an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

With regard to ECCS RESPONSE TIME values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 21).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1 and SR 3.5.2.2 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to RCIC storage tank water level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 2).

~~The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool and RCIC storage tank water level variations 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 RCIC storage tank water level condition.~~

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.

With regard to pump flow rates and differential pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3, 4, 5).

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.4 (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

In MODES 4 and 5, the RHR System may operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Therefore, RHR valves that are required for LPCI subsystem operation may be aligned for decay heat removal. This SR is modified by a Note that allows one LPCI subsystem of the RHR System to be considered OPERABLE for the ECCS function if all the required valves in the LPCI flow path can be manually realigned (remote or local) to allow injection into the RPV and the system is not otherwise inoperable. This will ensure adequate core cooling if an inadvertent vessel draindown should occur.

REFERENCES

1. USAR, Section 6.3.3.

2. Calculation IP-0-0049.

3. Calculations 01HP09/10/11 and IP-C-0042.

4. Calculations 01LP08/11/14 and IP-C-0043.

5. Calculations 01RH19/20/22/24/25 and IP-C-0041.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

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

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. Since the required reactor steam pressure must be available to perform SR 3.5.3.3 and SR 3.5.3.4, 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 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~A 92 day Frequency for SR 3.5.3.3 is consistent with the Inservice Testing Program requirements. The 24 month Frequency for SR 3.5.3.4 is based on the need to perform 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, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

With regard to RCIC steam supply pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 5).

With regard to the measured reactor pressure and flow rate values obtained pursuant to SR 3.5.3.3, as read from plant instrumentation assumed in Reference 5, are considered to be nominal values and therefore do not require compensation for instrument indication uncertainties.

With regard to the measured reactor pressure and flow rate values obtained pursuant to SR 3.5.3.4, the values as read from plant indication instrumentation are not considered to be nominal values with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 5).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 RCIC storage tank to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," overlaps this Surveillance to provide complete testing of the assumed safety function.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

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. USAR, Section 5.4.6.

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

4. Deleted.

5. Calculation 01RI15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.1 (continued)

specified in the Primary Containment Leakage Rate Testing Program. Conformance to the Primary Containment Leakage Rate Testing Program requires air lock leakage to be included in determining the overall primary containment leakage rate.

With regard to leakage rate values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 5).

SR 3.6.1.2.2

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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. 4), 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 nature of this interlock, and given that the interlock mechanism is only challenged when the primary containment air lock door is opened, this test is only required to be performed upon entering or exiting a primary containment air lock, but is not required more frequently than once per 184 days. The 184 day Frequency is based on engineering judgment and is considered adequate in view of other administrative controls.~~

REFERENCES

1. USAR, Section 3.8.

2. 10 CFR 50, Appendix J, Option B.

3. USAR, Section 6.2.1.

4. USAR, Section 15.7.4.

5 Calculation IP-0-0056.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.1 (continued)

capability would be required by SR 3.6.1.3.4 and SR 3.6.1.3.7).

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 the 36-inch valves may be opened for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances or special testing on the purge system that require the valves to be open (e.g., testing of containment and drywell ventilation radiation monitors), provided the 12-inch containment purge and the drywell vent and purge 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 PCIV requirements.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.3.2

This SR verifies that each primary containment isolation manual valve and blind flange that is located outside primary containment, drywell, and steam tunnel, 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 devices outside primary containment, drywell, and steam tunnel, and capable of being mispositioned, are in the correct position. ~~Since verification of valve position for devices outside primary containment, drywell, and steam tunnel is relatively easy, the 31 day Frequency was chosen to provide added assurance that the devices are in the correct positions.~~

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.6

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.

With regard to isolation time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 10).

SR 3.6.1.3.7

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

SR 3.6.1.3.8

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 References 1, 2, and 3 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.11

This SR ensures that the combined leakage rate of the primary containment feedwater penetrations is less than the specified leakage rate. The leakage rate is based on water as the test medium since these penetrations are designed to be sealed by the FWLCS. The 2 gpm leakage limit has been shown by testing and analysis to bound the condition following a DBA LOCA where, for a limited time, both air and water are postulated to leak through this pathway. The leakage rate of each primary containment feedwater penetration is assumed to be the maximum pathway leakage, i.e., the leakage through the worst of the two isolation valves [either 1B21-F032A(B) or 1B21-F065A(B)] in each penetration. This provides assurance that the assumptions in the radiological evaluations of References 1 and 2 are met (Ref. 15).

Dose associated with leakage (both air and water) through the primary containment feedwater penetrations is considered to be in addition to the dose associated with all other secondary containment bypass leakage paths.

The Frequency is in accordance with the Primary Containment Leakage Rate Testing Program.

A Note is added to this SR which states that the primary containment feedwater penetrations are only required to meet this leakage limit in Modes 1, 2, and 3. In other conditions, the Reactor Coolant System is not pressurized and specific primary containment leakage limits are not required.

SR 3.6.1.3.12

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

This SR requires a demonstration that each instrumentation line excess flow check valve (EFCV) which communicates to the reactor coolant pressure boundary (Ref. 16) is OPERABLE by verifying that the valve activates within the required flow range. For instrument lines connected to reactor coolant pressure boundary, the EFCVs serve as an additional flow restrictor to the orifices that are installed inside the drywell (Ref. 14). ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

(continued)

BASES (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to differential pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensatioN for instrument indication uncertainties (Ref. 4).

REFERENCES

1. USAR, Section 6.2.1.1.4.

2. USAR, Table 6.2-1.

3. USAR, Section 6.2.

4. Calculation IP-0-0066.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.5.1 (continued)

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 arithmetical average must consist of at least one reading from one location per quadrant as described in Ref. 3. However, all available instruments should be used in determining the arithmetical average.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

With regard to containment air temperature values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 4).

REFERENCES

1. USAR, Section 6.2.

2. USAR, Table 6.2-4.

3. USAR, Section 7.5.1.4.2.4.

4. Calculation IP-0-0067.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.6.1 (continued)

pressure and flow are achieved to perform this test. Adequate pressure at which this test is to be performed is consistent with the pressure recommended by the valve manufacturer.

2. The sample population of S/RVs tested to satisfy SR 3.4.4.1 will also be stroked in the relief mode during "as-found" testing to verify proper operation of the S/RV. The successful performance of the test sample of S/RVs provides reasonable assurance that all LLS valves will perform in similar fashion. After the S/RVs are replaced, the relief-mode actuator of the newly-installed S/RVs will be uncoupled from the S/RV stem, and cycled to ensure that no damage has occurred to the S/RV during transportation and installation. Following cycling, the relief-mode actuator is recoupled and the proper positioning of the stem nut is independently verified. This verifies that each replaced S/RV will properly perform its intended function.

~~The Frequency of the required relief-mode actuator testing is based on the tests required by ASME OM Part 1 (Ref. 3), as implemented by the Inservice Testing Program of Specification 5.5.6. The testing Frequency required by the Inservice Testing Program is based on operating experience and valve performance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

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

(continued)

BASES (continued)

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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

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 should provide the required containment pressure mitigation function thereby allowing operation of an RHR shutdown cooling loop when necessary.

SR 3.6.1.7.2

Verifying each RHR pump develops a flow rate ≥ 3800 gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded below the required flow rate during the cycle. It is tested in the pool cooling mode to demonstrate pump OPERABILITY without spraying down equipment in primary containment. Although this SR is satisfied by running the pump in the suppression pool cooling mode, the test procedures that satisfy this SR include appropriate acceptance criteria to account for the higher pressure requirements resulting from aligning the RHR System in the containment spray mode. The Frequency of this SR is in accordance with the Inservice Testing Program.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

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 3.3.6.3.5 overlaps this SR to provide complete testing of the safety function. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.7.4

This Surveillance is performed following activites that could result in nozzle blockage to verify that the spray nozzles are not obstructed and that flow will be provided when required. Such activities may include a loss of foreign material control (of if it cannot be assured), following a major configuration change, or following an inadvertent actuation of containment spray. This Surveillance is normally performed by an air or smoke flow test. ~~The Frequency is adequate due to the passive nozzle design and its normally dry state and has been shown to be acceptable through operating experience.~~

REFERENCES

1. USAR, Section 6.2.1.1.5.

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

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

4. USAR, Section 5.4.7

BASES

ACTIONS (continued)

C.1.

If the inoperable FWLCS subsystem cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 2) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that prohibits the application of LCO 3.0.4.a. This Note clarifies the intent of the Required Action by indicating that it is not permissible under LCO 3.0.4.a to enter MODE 3 from MODE 4 with the LCO not met. While remaining in MODE 3 presents an acceptable level of risk, it is not the intent of the Required Action to allow entry into, and continue operation in, MODE 3 from MODE 4 in accordance with LCO 3.0.4.a. However, where allowed, a risk assessment may be performed in accordance with LCO 3.0.4.b. Consideration of the results of this risk assessment is required to determine the acceptability of entering MODE 3 from MODE 4 when this LCO is not met. The allowed Completion Time is 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

A system functional test of each FWLCS subsystem is performed to ensure that each FWLCS subsystem will operate through its operating sequence. This includes verifying automatic positioning of valves and operation of each interlock, and that the necessary check valves open. Adequacy of the associated RHR pumps to deliver FWLCS flow rates required to meet the assumptions made in the supporting analyses concurrent with other modes was demonstrated during acceptance testing of the system after installation. Periodic verification of the capabilities of the RHR pumps is performed under SR 3.5.1.4.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

If suppression pool average temperature cannot be maintained ≤ 120°F, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the reactor pressure must be reduced to < 200 psig within 12 hours and the plant must be brought 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 without challenging plant systems.

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.

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 functional 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. Testing that adds heat to the suppression pool excludes RHR pump testing. 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~~ Frequency is 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to the 95°F suppression pool average temperature pursuant to this SR, as read from plant indication instrumentation, this limit is considered a nominal value and therefore does not require compensation for instrument indication uncertainties.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2.1

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to the suppression pool water minimum level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures. The suppression pool maximum water level values are considered to be nominal values and do not require compensation for instrument uncertainties (Ref. 2).

REFERENCES

1. USAR, Section 6.2.

2. Calculation IP-0-0049.

BASES (continued)

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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

(continued)

BASES

ACTIONS (continued)

B.1

When upper containment pool water temperature is > 120°F, the heat absorption capacity is inadequate to ensure that the suppression pool heat sink capability matches the safety analysis assumptions. Increased temperature has a relatively smaller impact on heat sink capability. Therefore, the upper containment pool water temperature must be restored to within limit within 24 hours. The 24 hour Completion Time is sufficient to restore the upper containment pool to within the specified temperature limit. It also takes into account the low probability of an event occurring that would require the SPMU System.

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 during the applicable MODES and considering the low probability of a DBA occurring between~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1 (continued)

~~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.~~

A fourth and fifth method (Items d. and e.) may be used to determine that there is sufficient water level combined between the upper containment pool and suppression pool when reactor pressure is less than 235 psig in MODE 3. The water level of the reactor cavity pool portion of the upper containment pool must be greater than el. 824 ft 7 inches, or the suppression pool water level must be greater than 19 ft 9 inches to satisfy this requirement.

With regard to upper containment pool water level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.~~

With regard to the water level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 5).

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.3 (continued)

~~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.~~

SR 3.6.2.4.4

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.4.7 overlaps this SR to provide complete testing of the safety function. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

This SR is modified by a Note that excludes make up to the suppression pool. Since all active components are testable, makeup to the suppression pool is not required.

REFERENCES

1. USAR, Section 6.2.

2. USAR, Chapter 15.

3. USAR, Section 6.2.7.

4. Calculation IP-0-0074.

5. Calculation IP-0-0075.

6. Calculation IP-M-0662.

BASES

SURVEILLANCE REQUIREMENTS

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.6.3.2.1 and SR 3.6.3.2.2

These SRs verify that there are no physical problems that could affect the igniter operation. Since the igniters 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 igniter 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 24 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 igniters 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 igniters (for a total of six) will result in an inoperable igniter division.~~ SR 3.6.3.2.2 is modified by a Note that indicates that the Surveillance is not required to be performed until 92 days after four or more igniters in the division are discovered to be inoperable.

With regard to circuit current and voltage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.2.3 and SR 3.6.3.2.4

These functional tests are performed ~~every 24 months~~ to verify system OPERABILITY. The current draw to develop a surface temperature of ≥ 1700°F is verified for igniters in inaccessible areas, e.g., in a high radiation area. Additionally, the surface temperature of each accessible igniter is measured to be ≥ 1700°F to demonstrate that a temperature sufficient for ignition is achieved. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to current draw and surface temperature values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

REFERENCES

1. 10 CFR 50.44.
2. 10 CFR 50, Appendix A, GDC 41.
3. USAR, Section 6.2.5.
4. Calculation IP-0-0076.

BASES

ACTIONS

B.1 and B.2 (continued)

reasonable period of time to verify that a loss of hydrogen control function does not exist. The verification 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 Containment/ Drywell Hydrogen Mixing Systems inoperable for up to 7 days. Seven days is a reasonable time to allow two Containment/ Drywell Hydrogen Mixing Systems 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 3.6.3.3.1

Operating each Containment/Drywell Hydrogen Mixing System ensures that each system 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.~~

(continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.3.2

Verifying that each Containment/Drywell Hydrogen Mixing System flow rate is ≥ 800 scfm ensures that each system is capable of maintaining drywell hydrogen concentrations below the flammability limit. In practice, verifying that the system differential pressure is less than 4.4 psid with the compressor running ensures that the system flow rate is greater than 800 scfm. ~~Operating experience has shown that these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to system differential pressure values used to verify the required system flow rate as read from plant indication instrumentation, the procedural limit is considered to be not nominal and therefore requires compensation for instrument indication uncertainties (Ref. 3).

REFERENCES

1. Regulatory Guide 1.7.

2. USAR, Section 6.2.5.

3. Calculation IP-0-0076.

BASES

ACTIONS

C.1 and C.2 (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

With regard to secondary containment vacuum values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

SR 3.6.4.1.2 and SR 3.6.4.1.3

Verifying that secondary containment equipment hatches and access doors 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, except when the access opening is being used for entry and exit. ~~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 controls on secondary containment access openings.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.4 and SR 3.6.4.1.5 (continued)

conditions. The primary purpose of these SRs is to ensure secondary containment boundary integrity. The secondary purpose of these SRs 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 for ensuring OPERABILITY of the SGT System. These SRs need not be performed with each SGT subsystem. ~~The SGT subsystem used for these Surveillances 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 Surveillances relative to the secondary containment OPERABILITY. ~~Operating experience has shown these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to drawdown time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Refs. 5, 6).

REFERENCES

1. USAR, Section 15.6.5.

2. USAR, Section 15.7.4.

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

4. Calculation IP-0-0082.

5. Calculation IP-0-0083.

6. Calculation IP-0-0084.

7. Calculation 3C10-1079-001.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1 (continued)

~~Since these SCIDs 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 SCIDs are in the correct positions.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

Two Notes have been added to this SR. The first Note applies to valves, dampers, 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 SCIDs, once they have been verified to be in the proper position, is low.

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

SR 3.6.4.2.2

Verifying the isolation time of each power operated and each automatic SCID is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCID will isolate in a time period less than or equal to that assumed in the safety analyses. ~~The Frequency of this SR is 92 days.~~

With regard to isolation time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.6.4.2.3

Verifying that each automatic SCID closes on a secondary containment isolation signal is required to prevent leakage of radioactive material from secondary containment following a DBA or other accident. This SR ensures that each automatic SCID 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 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

~~Operating experience has shown these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. USAR, Section 15.6.5.
2. USAR, Section 6.2.3.
3. USAR, Section 15.7.4.
4. Calculation IP-0-0085.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem from the main control room 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to operating time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 10).

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 bypass leakage and efficiency, minimum system flow rate, combined HEPA filter and charcoal adsorber pressure drop, and heater dissipation. The frequencies for performing the SGT System filter tests are in accordance with Regulatory Guide 1.52 (Ref. 4) and include testing initially, after 720 hours of system operation, once per 24 months, and following painting, fire, or chemical release in any ventilation zone communicating with the system. The laboratory test results will be verified to be within limits within 31 days of removal of the sample from the system. Additional information is discussed in detail in the VFTP.

With regard to filter testing values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 11).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.3.3

This SR requires verification that each SGT subsystem automatically 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, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.6.4.3.4

This SR requires verification that the SGT filter cooling 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, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. USAR, Section 6.2.3.
3. USAR, Section 15.6.5.
4. Regulatory Guide 1.52.
5. USAR, Section 6.5.1.
6. USAR, Section 15.6.4.
7. USAR Appendix A.
8. ASME/ANSI N510-1980.
9. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002
10. Calculation IP-0-0086.
11. Calculation IP-0-0087.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1.1 (continued)

Surveillance is only required to be performed once within 72 hours after each closing. The Frequency of 72 hours is based on operating experience.

With regard to seal leakage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

SR 3.6.5.1.2

This SR requires a test to be performed to verify overall air lock leakage of the drywell air lock at pressures ≥ 3.0 psig. Prior to performance of this test, the air lock must be pressurized to 19.7 psid. This differential pressure is the assumed peak drywell pressure expected from the accident analysis. Since the drywell pressure rapidly returns to a steady state maximum differential pressure of 3.0 psid (due to suppression pool vent clearing), the overall air lock leakage is allowed to be measured at this pressure.

An overall air lock leakage limit of ≤ 2 scfh has been established to ensure the integrity of the seals. ~~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 violating the drywell boundary. Operating experience has shown these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

With regard to air lock leakage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1.3

The analyses in Reference 1 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 $A/\sqrt{k}$ 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 the design $A/\sqrt{k}$. At the design $A/\sqrt{k}$ the containment temperature and pressurization response are bounded by the assumptions of the safety analysis. One drywell air lock door is left open during each drywell bypass leakage test such that each drywell air lock door is leak tested during at least every other drywell bypass leakage test. This ensures that the leakage through the drywell air lock is properly accounted for in the measured bypass leakage and that each air lock door is tested periodically.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~This Surveillance is performed at least once every 10 years (120 months) on a performance based frequency. The Frequency is consistent with the difficulty of performing the test, risk of high radiation exposure, and the remote possibility that sufficient component failures will occur such that the drywell bypass leakage limit will be exceeded.~~ This Frequency is modified by a note that allows for a one-time deferral of this surveillance until November 23, 2008. If during the performance of this required Surveillance the drywell bypass leakage is determined to be greater than the leakage limit, the Surveillance Frequency is increased to at least once every 48 months. If during the performance of the subsequent consecutive Surveillance the drywell bypass leakage is determined to be less than or equal to the drywell bypass leakage limit, the ~~10-year~~ Frequency may be resumed. If during the performance of the subsequent consecutive Surveillance the drywell bypass leakage is determined to be greater than the drywell bypass leakage limit, the Surveillance Frequency is increased to at least once every 24 months. The 24-month Frequency must be maintained until the drywell bypass leakage is determined to

specified in the Surveillance Frequency Control Program

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1.3 (continued)

be less than or equal to the leakage limit during the performance of two consecutive Surveillances, at which time the ~~10-year~~ Frequency may be resumed. For two Surveillances to be considered consecutive, the Surveillances must be performed at least 12 months apart.

specified in the Surveillance Frequency Control Program

~~Since the Frequency is performance based, the Frequency was concluded to be acceptable from a reliability standpoint.~~

With regard to bypass leakage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

SR 3.6.5.1.4

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 Frequency was chosen so that the interior and exterior surfaces of the drywell can be inspected in conjunction with the inspections of the primary containment required by 10 CFR 50, Appendix J (Ref. 2). Due to the passive nature of the drywell structure, the specified Frequency is sufficient to identify component degradation that may affect drywell structural integrity.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Chapter 6 and Chapter 15.

2. 10 CFR 50, Appendix J, Option B.

3. Calculation IP-0-0088.

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 door opening will not inadvertently occur. ~~Due to the nature of this interlock, and given that the interlock mechanism is only challenged when a drywell air lock door is opened, this test is only required to be performed once every 24 months. The 24-month Frequency is based on the need to perform this Surveillance under the reduced reactivity conditions that apply during a plant outage and the potential for violating the drywell boundary. Operating experience has shown these components usually pass the Surveillance. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

ACTIONS (continued)

B.1

With one or more drywell vent and purge penetration flow paths with two drywell isolation valves inoperable, the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. The 4 hour Completion Time is acceptable, due to the low probability of the inoperable valves resulting in excessive drywell leakage and the low probability of the limiting event for drywell leakage occurring during this short time. In addition, the Completion Time is reasonable, considering the time required to isolate the penetration, and the probability of a DBA, which requires the drywell isolation valves to close, occurring during this short time is very low.

Condition B is modified by a Note indicating this Condition is only applicable to drywell vent and purge penetration flow paths. For other penetration flow paths, only one drywell isolation valve is required OPERABLE and, 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

Each 24-inch drywell vent and purge supply isolation valve is required to be periodically verified sealed closed ~~at 31 day intervals~~. This Surveillance applies to drywell vent and purge supply isolation valves since they are not qualified to close under accident conditions. This SR is designed to ensure that a gross breach of drywell is not caused by an inadvertent or spurious drywell vent and purge isolation

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.3.1 (continued)

valve opening. Detailed analysis of these 24-inch drywell vent and purge supply 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 the sealed closed position during MODES 1, 2, and 3. These 24-inch drywell vent and purge supply valves that are sealed closed must be under administrative control to assure that they cannot be inadvertently opened. Administrative control includes mechanical devices to seal or lock the valve closed, or to prevent power from being supplied to the valve operator. This can be accomplished by removing the air supply to the valve operator or tagging the control switches in the main control room in the closed position. In this application, the term "sealed" has no connotation of leakage within limits. ~~The Frequency is based on purge valve use during unit operations.~~

SR 3.6.5.3.2

This SR ensures that the 36-inch and either the 10-inch or the 24-inch drywell vent and purge exhaust isolation valves are closed as required or, if open, open for an allowable reason. These drywell vent and purge isolation valves 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 36-inch and either the 10-inch or the 24-inch drywell vent and purge exhaust valves are open for pressure control, ALARA or air quality considerations for personnel entry, or Surveillances or special testing of the purge system that require the valves to be open (e.g., testing of the containment and drywell ventilation radiation monitors) provided both the 12-inch and 36-inch primary containment purge system supply and exhaust lines are isolated. Normally, the 36-inch drywell vent and purge exhaust isolation valve is open to support operation of the 12-inch Continuous Containment Purge System. This is considered to be within the allowances of the Note. ~~The 31 day Frequency is consistent with the other purge valve requirements.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power, 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. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. USAR, Section 6.2.4.

2. CPS ISI Manual.

3. Calculation IP-0-0091.

BASES

ACTIONS

B.1 and B.2 (continued)

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 differential 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to drywell-to-primary containment differential pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 6).

REFERENCES

1. USAR, Section 6.2.1.
2. USAR, Section 3.8.
3. USAR, Section 6.2.1.1.6.
4. USAR, Section 6.2.7.
5. USAR, Section 3.8, Attachment A3.8.
6. Calculation IP-0-0092.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.5.1 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

average must consist of at least one reading from each elevation (with the exception that elevations 729 ft. 0 inches and 732 ft. 0 inches may be considered the same elevation) as described in Ref. 3. However, all available instruments should be used in determining the arithmetical average.

~~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.~~

With regard to drywell average air temperature values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 4).

REFERENCES

1. USAR, Section 6.2.1.

2. USAR, Section 9.4.7.

3. USAR, Section 7.5.1.4.2.4.

4. Calculation IP-0-0093.

ACTIONS

D.1 and D.2 (continued)

the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

E.1

If one drywell post-LOCA vacuum relief subsystem is inoperable for reasons other than Condition A or two or more drywell post-LOCA vacuum relief subsystems are inoperable for reasons other than Condition A, and not restored within the provided Completion Time, the plant must be brought to a condition in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 2) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Required Action E.1 is modified by a Note that prohibits the application of LCO 3.0.4.a. This Note clarifies the intent of the Required Action by indicating that it is not permissible under LCO 3.0.4.a to enter MODE 3 from MODE 4 with the LCO not met. While remaining in MODE 3 presents an acceptable level of risk, it is not the intent of the Required Action to allow entry into, and continue operation in, MODE 3 from MODE 4 in accordance with LCO 3.0.4.a. However, where allowed, a risk assessment may be performed in accordance with LCO 3.0.4.b. Consideration of the results of this risk assessment is required to determine the acceptability of entering MODE 3 from MODE 4 when this LCO is not met.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.6.1

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

Each drywell post-LOCA vacuum relief valve is verified to be closed (except when being tested in accordance with SR 3.6.5.6.2 and SR 3.6.5.6.3 or when the drywell post-LOCA vacuum relief valves are performing their intended design function) to ensure that this potential large drywell bypass leakage path is not present. This Surveillance is normally performed by observing the drywell post-LOCA vacuum relief valve position indication. ~~The 7 day Frequency is based on engineering judgment, is considered adequate in view of other indications of drywell post-LOCA vacuum relief valve status available to the plant personnel, and has been shown to be acceptable through operating experience.~~

(continued)

BASES

SURVEILLANCE REQUIREMEN

SR 3.6.5.6.1 (continued)

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

SR 3.6.5.6.2

Each drywell post-LOCA vacuum relief 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 drywell post-LOCA vacuum relief valves are OPERABLE.~~

SR 3.6.5.6.3

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

Verification of the drywell post-LOCA vacuum relief valve opening differential pressure is necessary to ensure that the safety analysis assumptions of $\leq$ 0.2 psid for drywell vacuum relief are valid. The safety analysis assumes that the drywell post-LOCA vacuum relief valves will start opening when the dry well pressure is approximately 0.2 psid less than the containment and will be fully open when this differential pressure is 0.5 psid. ~~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 violating the drywell boundary. Operating experience has shown these components usually pass the Surveillance, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. USAR, Section 6.2.

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies UHS water volume is ≥ 593 acre-feet (excluding sediment). The Surveillance Frequency is in accordance with UHS Erosion, Sediment Monitoring and Dredging Program.

With regard to UHS water volume values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 9).

SR 3.7.1.2

Verifying the correct alignment for each manual, power operated, and automatic valve in each Division 1 and 2 SX subsystem flow path provides assurance that the proper flow paths will exist for Division 1 and 2 SX subsystem 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 potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

Isolation of the SX subsystem to components or systems does not necessarily affect the OPERABILITY of the associated SX subsystem. As such, when all SX pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the associated SX subsystem needs to be evaluated to determine if it is still OPERABLE. Alternatively, it is acceptable and conservative to declare an SX subsystem inoperable when a branch connection is isolated or a supported ventilation system is inoperable.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.1.3

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

This SR verifies that the automatic isolation valves of the Division 1 and 2 SX subsystems 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 and is performed with the plant shut down. This SR also verifies the automatic start capability of the SX pump in each subsystem. ~~Operating experience has shown that these components usually pass the SR. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. Regulatory Guide 1.27, Revision 2, January 1976.

2. USAR, Section 9.2.1.2.

3. USAR, Table 9.2-3.

4. USAR, Section 6.2.1.1.3.3.

5. USAR, Chapter 15.

6. USAR, Section 6.2.2.3.

7. USAR, Table 6.2-2.

8. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

9. Calculation IP-0-0095.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1 (continued)

Isolation of the Division 3 SX subsystem to components or systems does not necessarily affect the OPERABILITY of the Division 3 SX subsystem. As such, when the Division 3 SX pump, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the Division 3 SX subsystem needs to be evaluated to determine if it is still OPERABLE. Alternatively, it is acceptable and conservative to declare an SX subsystem inoperable when a branch connection is isolated or a supported ventilation system is inoperable.

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

SR 3.7.2.2

This SR verifies that the automatic isolation valves of the Division 3 SX subsystem 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 and is performed with the plant shut down. This SR also verifies the automatic start capability of the Division 3 SX pump.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~Operating experience has shown that these components usually pass the SR. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. USAR, Section 9.2.1.2.
2. USAR, Chapter 6.
3. USAR, Chapter 15.

ACTIONS (continued)

G.1, G.2, and G.3

During movement of irradiated fuel assemblies in the primary or secondary containment, during CORE ALTERATIONS, or during OPDRVs, with two Control Room Ventilation subsystems inoperable or with one or more Control Room Ventilation subsystems inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require treatment of the control room air. This places the unit in a condition that minimizes the accident risk.

If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in the primary and 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 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 3.7.3.1 and SR 3.7.3.2

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 accumulated in the charcoal from humidity in the ambient air. The Makeup Filter System must be operated from the main control room for ≥ 10 continuous hours with the heaters energized. The Recirculation Filter System (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.~~

Periodic

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 and SR 3.7.3.2 (continued)

With regard to subsystem operation time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 8, 9).

SR 3.7.3.3

This SR verifies that the required Control Room Ventilation System testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber bypass leakage and efficiency, minimum system flow rate (scfm), combined HEPA filter and charcoal adsorber pressure drop, and heater dissipation in accordance with Regulatory Guide 1.52 (Ref. 10). The Frequencies for performing the Control Room Ventilation System filter tests are also in accordance with Regulatory Guide 1.52 (Ref.10). Specific test frequencies and additional information are discussed in detail in the VFTP.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.7.3.4

This SR verifies that each Control Room Ventilation subsystem starts and operates on an actual or simulated high radiation initiation signal. ~~While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

(continued)

BASES

ACTIONS

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

During movement of irradiated fuel assemblies in the primary or secondary containment, during CORE ALTERATIONS, or during OPDRVs, if the Required Action and associated Completion Time of Condition B is not met, action must be taken to immediately suspend activities that present a potential for releasing radioactivity that might require operation of the Control Room Ventilation System in the high radiation mode. This places the unit in a condition that minimizes risk.

If applicable, CORE ALTERATIONS and handling of irradiated fuel in the primary and 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 analysis. The SR consists of a combination of testing and calculation. ~~The 24 month Frequency is appropriate since significant degradation of the Control Room AC System is not expected over this time period.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to heat removal capability values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 4).

REFERENCES

1. USAR, Section 6.4.

2. USAR, Section 9.4.1.

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

4. Calculation IP-0-0102.

BASES

ACTIONS

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

in at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action B.3 is modified by a Note that prohibits the application of LCO 3.0.4.a. This Note clarifies the intent of the Required Action by indicating that it is not permissible under LCO 3.0.4.a to enter MODE 3 from MODE 4 with the LCO not met. While remaining in MODE 3 presents an acceptable level of risk, it is not the intent of the Required Action to allow entry into, and continue operation in, MODE 3 from MODE 4 in accordance with LCO 3.0.4.a. However, where allowed, a risk assessment may be performed in accordance with LCO 3.0.4.b. Consideration of the results of this risk assessment is required to determine the acceptability of entering MODE 3 from MODE 4 when this LCO is not met. The allowed Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1 and SR 3.7.5.2

SR 3.7.5.2~~, 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-85m, Kr-87, and Kr-88 (Ref. 5). If the measured release 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, as required by SR 3.7.5.1, to ensure that the increase is not indicative of a sustained increase in the radioactivity rate. The required isotopic analysis is intended to support determination of the cause for the increase in offgas radiation release rates, such as the onset of leakage from a fuel pin(s). However, there are certain evolutions (e.g., swapping of the steam jet air ejectors and regeneration of the offgas system desiccant dryers) which are known to result in a predictable and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1 and SR 3.7.5.2 (continued)

temporary increase in the indicated offgas radioactivity release rate. These indicated increases in offgas radioactivity release rates can be caused solely by increases in offgas flow. Since these increases are due to an evolution(s) known to cause such an increase and not due to an actual increase in the "nominal steady state fission gas release rate," isotopic analysis of an offgas sample is not required for these evolutions. In any of these cases, it is prudent to ensure that the offgas radiation level (radioactivity release rate) returns to previous or expected levels within four hours or as soon as possible following the evolution. This will confirm that there are no other causes for the increase in the radioactivity release rate indication. ~~The 31 day Frequency is adequate in view of other instrumentation that continuously monitor the offgas, and is acceptable based on operating experience.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the 24 month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.~~

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 (bypass valve begins to open in ≤ 0.1 seconds and 80% of turbine bypass system capacity is established in ≤ 0.3 seconds) are specified in applicable surveillance test procedures. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the 24 month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.~~

With regard to TURBINE BYPASS SYSTEM RESPONSE TIME values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

(continued)

BASES (continued)

LCO

The specified water level preserves the assumption of the fuel handling accident analysis (Ref. 2). As such, it is the minimum required for fuel movement within the spent fuel storage pool and upper containment fuel storage pool.

APPLICABILITY

This LCO applies whenever movement of irradiated fuel assemblies occurs in the associated fuel storage racks since the potential for a release of fission products exists.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply. 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 in the associated fuel storage pool.

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 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 water level changes are controlled by unit procedures.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to fuel pool water level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 6).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

For the Division 1 and 2 DGs, DG operation is returned to the isochronous mode upon switchover such that rated speed/frequency is automatically attained. For the Division 3 DG, however, with the DG governor initially operating in the droop condition during the test mode, operator action may be required to reset the governor for ready-to-load operation at the required frequency. This difference is acknowledged in the Bases for SR 3.8.1.17 to address compliance with that SR. Notwithstanding, the condition also requires the Division 3 DG to be considered inoperable if it cannot be ensured that the required frequency would be attained in the event of a LOCA and a loss of offsite power concurrent with the Division 3 DG being operated or tested with the existing droop setting in effect. Thus, the Division 3 DG is generally considered inoperable while the droop setting is in effect during the performance of SRs that require the DG to be paralleled to the offsite source.

SR 3.8.1.1

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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

SR 3.8.1.2 and SR 3.8.1.7

These 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 Notes (the Note for SR 3.8.1.7 and Note 2 for SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

For the purposes of this testing, the DGs are started from standby conditions. Standby conditions mean that the lube oil is heated by the jacket water and continuously circulated through a portion of the system as recommended by the vendor. Engine jacket water is heated by an immersion heater and circulates through the system by natural circulation. This allowance is not intended to impose a maximum limit on engine temperatures. For the purposes of these SRs, the DG may be started using a manual start signal, a simulated loss of offsite power test signal by itself, a simulated loss of offsite power test signal in conjunction with an ECCS actuation test signal, or an ECCS actuation test signal by itself.

In order to reduce stress and wear on diesel engines, the manufacturer recommends 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 modified start procedures are the intent of Note 3, which is only applicable when such procedures are used.

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 (Ref. 5). The 12 second start requirement may not be applicable to SR 3.8.1.2 (see Note 3 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. This is the intent of Note 1 of SR 3.8.1.2. Similarly, the performance of SR 3.8.1.12 or SR 3.8.1.19 also satisfies the requirements of SR 3.8.1.2 and SR 3.8.1.7.

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

~~The normal 31 day Frequency for SR 3.8.1.2 (see Table 3.8.1-1, "Diesel Generator Test Schedule") is consistent with the industry guidelines for assessment of diesel generator performance (Ref. 13). 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to required voltage and frequency values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Refs. 17, 18, 19, 22, 23).

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. However, consistent with the recommendations of Regulatory Guide 1.9, Revision 3 (Ref. 16), this surveillance is performed with a DG load equal to or greater than 90 percent of its continuous rating. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while 1.0 is an operational limitation to ensure circulating currents are minimized.

~~The normal 31 day Frequency for this Surveillance (see Table 3.8.1-1) is consistent with the industry guidelines for assessment of diesel generator performance (Ref. 13).~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.3 (continued)

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 shall 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.

With regard to DG loading values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 20).

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the low level alarm setpoint. 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 maximum expected post LOCA loads.

~~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.~~

With regard to fuel oil level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 21).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. ~~Removal~~ Periodic removal of water from the fuel oil day tanks ~~once every 31 days~~ eliminates the necessary environment for bacterial survival. This is an 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, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~The Surveillance Frequency is established by Regulatory Guide 1.137 (Ref. 11).~~ 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.

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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The design of fuel transfer systems is such that pumps operate automatically in order to maintain an adequate volume of fuel oil in the day tanks during or following DG testing. Therefore, a 31 day Frequency is specified to correspond to the maximum interval for DG testing.~~

SR 3.8.1.7

See SR 3.8.1.2.

(continued)

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. ~~The 24 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. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

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 a load equivalent to at least as large as the largest single load while maintaining a specified margin to the overspeed trip.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

The referenced load for DG 1A is the low pressure core spray pump; for DG 1B, the residual heat removal (RHR) pump; and for DG 1C the HPCS pump. The Shutdown Service Water (SX) pump values are not used as the largest load since the SX supplies cooling to the associated DG. If this load were to trip, it would result in the loss of the DG. The use of larger loads for reference purposes is acceptable. This Surveillance may be accomplished by:

1) Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest load while paralleled to offsite power, or while supplying the bus, or

2) Tripping its associated single largest load with the DG supplying the bus.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

~~The 24 month Frequency is consistent with the refuel cycle recommendations of Regulatory Guide 1.9 (Ref. 16).~~

This SR has been modified by two Notes. The intent of Note 1 is to indicate that credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

While the DG is not expected to experience this transient during an event and continue 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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

~~The 24 month Frequency is consistent with the refuel cycle recommendation of Regulatory Guide 1.9 (Ref. 16) and is intended to be consistent with expected fuel cycle lengths.~~

This SR has been modified by a Note. The intent of the Note is to indicate that credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Testing performed for this SR is normally conducted with the DG being tested (and the associated safety-related distribution subsystem) connected to one offsite source, while the remaining safety-related (and non-safety related) distribution systems are aligned to the other offsite source (or unit auxiliary transformers). This minimizes the possibility of common cause failure resulting from offsite/grid voltage perturbations.

This Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite of grid perturbations.

With regard to DG load and voltage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 24).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 24 months is consistent with the refuel cycle recommendations of Regulatory Guide 1.9 (Ref. 16), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions. Standby conditions mean that the lube oil is heated by the jacket water and continuously circulated through a portion of the system as recommended by the vendor. Engine jacket water is heated by an immersion heater and circulates through the system by natural circulation. This allowance is not intended to impose a maximum limit on engine temperatures. 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. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to DG start time, required voltage and frequency values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Refs. 17, 18, 19, 22, 23).

~~The Frequency of 24 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. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions. Standby conditions mean that the lube oil is heated by the jacket water and continuously circulated through a portion of the system as recommended by the vendor. Engine jacket water is heated by an immersion heater and circulates through the system by natural circulation. This allowance is not intended to impose a maximum limit on engine temperatures. 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. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

SR 3.8.1.13

This Surveillance demonstrates that DG non-critical protective functions (e.g., high jacket water temperature) are bypassed on an ECCS initiation test signal and critical protective functions trip the DG to avert substantial damage to the DG unit. The non-critical trips are bypassed during DBAs and provide alarms on abnormal engine conditions. These alarms provide the operator with necessary information 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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 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. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

The SR is modified by a Note. The intent of the Note is to indicate that credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.13 (continued)

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

SR 3.8.1.14

Regulatory Guide 1.9, Revision 3 (Ref. 16) requires demonstration ~~once per 24 months~~ that the DGs can start and run continuously at or near full-load capability for an interval of not less than 24 hours. The DGs are to be loaded equal to or greater than 105 percent of the continuous rating for at least 2 hours and equal to or greater than 90 percent of the continuous rating for the remaining hours of the test (i.e., 22 hours) (Ref. 16). 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.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

~~The 24 month Frequency is consistent with the refuel cycle recommendations of Regulatory Guide 1.9, Revision 3 (Ref. 16); 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 two 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 intent of Note 2 is to indicate that credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.14 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Testing performed for this SR is normally conducted with the DG being tested (and the associated safety-related distribution subsystem) connected to one offsite source, while the remaining safety-related (and non-safety related) distribution systems are aligned to the other offsite source (or unit auxiliary transformers). This minimizes the possibility of common cause failures resulting from offsite/grid voltage perturbations.

With regard to DG loading capability values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 20).

SR 3.8.1.15

This Surveillance is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(5), and 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.

With regard to DG loading values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 20).

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to DG start time, frequency and voltage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Refs. 17, 18, 19, 22, 23).

~~The 24 month Frequency is consistent with the refuel cycle recommendations of Regulatory Guide 1.9, Revision 3 (Ref. 16).~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

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 (i.e., equal to or greater than 90 percent of the continuous rating) prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and load transfer from the DG to each offsite power 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 undervoltage 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

Portions of the synchronization circuit are associated with the DG and portions with the offsite circuit. If a failure in the synchronization requirement of the Surveillance occurs, depending on the specific affected portion of the synchronization circuit, either the DG or the associated offsite circuit is declared inoperable.

~~The Frequency of 24 months is consistent with the refuel cycle recommendations of Regulatory Guide 1.9 (Ref. 16), and takes into consideration plant conditions required to perform the Surveillance.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.17 (continued)

ready-to-load operation in order to complete the surveillance for the Division 3 DG. Resetting the governor ensures that the DG will supply the Division 3 bus at the required frequency in the event of a LOCA and a loss of offsite power while the DG is in a droop condition during the test mode.

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 requirement 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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24 month Frequency is consistent with the refuel cycle recommendations of Regulatory Guide 1.9 (Ref. 16); 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 intent of this note is to indicate that credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Testing performed for this SR is normally conducted with the DG being tested (and the associated safety-related distribution subsystem) connected to one offsite source, while the remaining safety-related (and non-safety related) distribution systems are aligned to the other offsite source (or unit auxiliary transformers). This minimizes the possibility of common cause failures resulting from offsite/grid voltage perturbations.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident conditions with a loss of offsite power, loads are sequentially connected to the bus by the load sequencing logic (except for Division 3 which has no load sequence timers). 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 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 and is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(2). Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 24 months is consistent with the refuel cycle recommendations of Regulatory Guide 1.9 (Ref. 16); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~

This SR is modified by a Note. The reason for the Note is that performing the Surveillance during these MODES may perturb the electrical distribution system, and challenge plant safety systems. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

With regard to sequence time values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 25).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.19

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

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an ECCS initiation signal. For load shedding effected via shunt trips that are actuated in response to a LOCA signal (i.e., "ECCS initiation signal"), this surveillance includes verification of the shunt trips (for Divisions 1 and 2 only) in response to LOCA signals originating in the ECCS initiation logic as well as the Containment and Reactor Vessel Isolation and Control System actuation logic. 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 may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 24 months.~~

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions. Standby conditions mean that the lube oil is heated by the jacket water and continuously circulated through a portion of the system as recommended by the vendor. Engine jacket water is heated by an immersion heater and circulates through the system by natural circulation. This allowance is not intended to impose a maximum limit on engine temperatures. 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. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

With regard to DG start time, required voltage and frequency values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Refs. 17, 18, 19, 22).

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.20

This Surveillance is performed with the plant shut down and 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. 10).~~

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions. Standby conditions mean that the lube oil is heated by the jacket water and continuously circulated through a portion of the system as recommended by the vendor. Engine jacket water is heated by an immersion heater and circulates through the system by natural circulation. This allowance is not intended to impose a maximum limit on engine temperatures.

With regard to required voltage and frequency values obtained pursuant to this SR, as read from plant indication

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.20 (continued)

instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Refs. 17, 18, 19, 22, 23).

~~Diesel Generator Test Schedule~~

~~The DG test schedule (Table 3.8.1-1) implements the industry guidelines for assessment of diesel generator performance (Ref. 13). The purpose of this test schedule is to provide timely test data to establish a confidence level associated with the goal to maintain DG reliability at > 0.95 per test.~~

~~According to the industry guidelines (Ref. 13), each DG unit should be tested at least once every 31 days. Whenever a DG has experienced 4 or more valid failures in the last 25 valid tests, the maximum time between tests is reduced to 7 days. Four failures in 25 valid tests is a failure rate of 0.16, or the threshold of acceptable DG performance, and hence may be an early indication of the degradation of DG reliability. When considered in the light of a long history of tests, however, 4 failures in the last 25 valid tests may only be a statistically probable distribution of random events. Increasing the test Frequency allows a more timely accumulation of additional test data upon which to base judgment of the reliability of the DG. The increased test Frequency must be maintained until seven consecutive failure free tests have been performed.~~

~~The Frequency for accelerated testing is 7 days, but no less than 24 hours. Tests conducted at intervals of less than 24 hours may be credited for compliance with Required Actions. However, for the purpose of re-establishing the normal 31-day Frequency, a successful test at an interval of less than 24 hours should be considered an invalid test and not count towards the seven consecutive failure free starts, and the consecutive test count is not reset.~~

~~A test interval in excess of 7 days (or 31 days, as appropriate) constitutes a failure to meet SRs and results in the associated DG being declared inoperable. It does not, however, constitute a valid test or failure of the DG, and any consecutive test count is not reset.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1 (continued)

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to lube oil inventory values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 11).

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of maximum expected post LOCA load operation for each DG. This minimum volume 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 maximum expected post LOCA 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 times are closely monitored by the plant staff.~~

With regard to lube oil inventory values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 8).

SR 3.8.3.3

The tests of fuel oil prior to addition to the storage tanks 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 acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between the sample (and corresponding results) of new fuel and addition of new fuel oil to the storage tanks to exceed 31 days. The limits and applicable ASTM Standards for the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.3 (continued)

Fuel oil degradation during long term storage shows up as an increase in particulate, mostly due to oxidation. The presence of particulate does not mean that the fuel oil will not burn properly in a diesel engine. However, the particulate can cause fouling of filters and fuel oil injection equipment, which can cause engine failure.

Particulate concentrations should be determined in accordance with ASTM D6217-98(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.

The Frequency of this Surveillance takes into consideration fuel oil degradation trends indicating that particulate concentration is unlikely to change between Frequency intervals.

With regard to fuel oil property values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 9).

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 provides for multiple start attempts without recharging when pressurized above the low pressure alarm setpoint. The pressure specified in this SR reflects a value at which multiple starts can be accomplished, but is not so high as to result in failing the limit due to normal cycling of the recharge compressor.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.4 (continued)

With regard to air start capacity values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 10).

SR 3.8.3.5

Periodic removal

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 92 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, contaminated fuel oil, and from breakdown of the fuel oil by bacteria.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

REFERENCES

1. USAR, Section 9.5.4.
2. Regulatory Guide 1.137.
3. ANSI N195, Appendix B, 1976.
4. USAR, Chapter 6.
5. USAR, Chapter 15.
6. ASTM Standards: D4057-95; D1298-99; D975-06b; D4176-93; D6217-98.
7. Deleted.
8. Calculation IP-0-0120.
9. Calculation IP-0-0121.
10. Calculation IP-0-0122.
11. Calculation IP-C-0111.

BASES (continued)

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 (or battery cell) 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 continually 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's recommendations and IEEE-450 (Ref. 9).~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to battery terminal voltage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 13).

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 10), 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 ensure that these requirements can be satisfied. This SR provides two options. One option requires that each battery charger be capable of supplying 300 amps for Divisions 1 and 2 (100 amps for Divisions 3 and 4) at the minimum established float voltage for 4 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 or the status of the plant during which these demands occur).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.2 (continued)

This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ 2 amps.

~~The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to minimum required amperes and duration values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 13).

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 are established with a dummy load that corresponds to the design duty cycle requirements as specified in Reference 4.

~~The Surveillance Frequency of 24 months is an exception to the recommendations of Regulatory Guide 1.32 (Ref. 10) and Regulatory Guide 1.129 (Ref. 11), 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 SR 3.8.6.6 in lieu of SR 3.8.4.3. This substitution is acceptable because SR 3.8.6.6 represents an equivalent test of battery capability as SR 3.8.4.3. The reason for Note 2 is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance. Examples of unplanned events may include:

(continued)

BASES

ACTIONS (continued)

E.1

Batteries in redundant trains with battery parameters not within limits, there is not sufficient assurance that battery capacity has not been affected to the degree that the batteries can still perform their required function, given that redundant batteries are involved. With redundant batteries involved, this potential could result in a total loss of function on multiple systems that rely upon the batteries. The longer completion times specified for battery parameters on non-redundant batteries not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one train within 2 hours.

F.1

When any battery parameter is outside the allowances of the Required Actions for Condition A, B, C, D, or E, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. Additionally, discovering a battery in one train with one or more battery cells float voltage less than 2.07 V and float current greater tan 2 amps, indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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 Standard 450-1995 (Ref. 3). ~~The 7 day frequency is consistent with IEEE Standard 450-1995.~~

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.2 and 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 127.6 V at the battery terminals, or 2.20 Vpc. This provides adequate overpotential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltage, 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 Standard 450-1995 (Ref. 3).~~

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 450-1995 (Ref. 3).~~

SR 3.8.6.4

This surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., 65 degrees F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. ~~The Frequency is consistent with IEEE 450-1995 (Ref. 3).~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.8.6.6

A battery performance 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.

The acceptance criteria for this Surveillance is consistent with IEEE Standard 450-1995 (Ref. 3) and IEEE Standard 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 there is ample capacity to meet the load requirements. Furthermore, the battery is

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.6 (continued)

sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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, the Surveillance Frequency is reduced to 12 months. Degradation is indicated, according to IEEE Standard 450 (Ref. 3), when the battery capacity drops by more than 10% relative to its capacity on the previously performance test or when it is ≥ 10% below the manufacturer's rating. These Frequencies are based on the recommendations in IEEE Standard 450 (Ref. 3).

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. Credit may be taken for unplanned events that satisfy the Surveillance. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

REFERENCES

1. USAR, Chapter 6.

2. USAR, Chapter 15.

3. IEEE Standard 450, 1995.

4. Calculation IP-0-0123.

5. IEEE Standard 485, 1983

6. USAR, Chapter 8.

BASES

ACTIONS (continued)

F.1 and F.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 uninterruptible AC 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 uninterruptible AC 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to voltage and frequency values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 5).

REFERENCES

1. USAR, Chapter 8.

2. USAR, Chapter 6.

3. USAR, Chapter 15.

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

5. Calculation IP-0-0131.

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2. (continued)

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 uninterruptible AC 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 uninterruptible AC 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to voltage and frequency values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

REFERENCES

1. USAR, Chapter 6.

2. USAR, Chapter 15.

3. Calculation IP-0-0131.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

Meeting this Surveillance verifies that the required AC, DC, and uninterruptible AC 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 uninterruptible AC bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to voltage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 6).

REFERENCES

1. USAR, Chapter 6.

2. USAR, Chapter 15.

3. Regulatory Guide 1.93, December 1974.

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

5. USAR, Section 8.3.

6. Calculation IP-0-0132.

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5 (continued)

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the plant safety systems may be without power.

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

This Surveillance verifies that the required AC, DC, and uninterruptible AC bus electrical power distribution subsystems are functioning properly, with the buses energized. The verification of proper voltage availability on the required 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.~~

With regard to voltage values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 3).

REFERENCES

1. USAR, Chapter 6.

2. USAR, Chapter 15.

3. Calculation IP-0-0132.

BASES

ACTIONS

B.1 (continued)

status within 24 hours. The Completion Time of 24 hours is reasonable, taking into account the low probability of an SVC failure occurring in this time period and the realistic potential for an SVC failure to adversely affect plant equipment.

C.1

If the required SVC protection subsystems cannot be restored to OPERABLE status within the required Completion Time, the SVC must be placed in a configuration for which the SVC Protection System LCO does not apply. This is accomplished by disconnecting the associated SVC from the plant auxiliary power system by opening (at least one of) the SVC main circuit breakers. The Completion Time of one hour allows for an orderly disconnection of the SVC, including evaluation of the resultant impact on required voltage for the onsite ESF busses (i.e., for compliance with LCO 3.8.1, "AC Sources-Operating," or LCO 3.8.2, "AC Sources-Shutdown").

SURVEILLANCE REQUIREMENTS

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.8.11.1

The SVC local control panel is checked to confirm satisfactory operation of the SVC Protection System(s). This includes verifying that no warning or trouble lights that could be indicative of SVC Protection System degradation are present, and checking the overall condition and/or status of relays to qualitatively confirm satisfactory operation of the SVC and SVC Protection System.

~~The 24-hour Frequency is based on manufacturer's recommendations.~~

SR 3.8.11.2

A system functional test of each SVC Protection System is performed to ensure that each SVC protection subsystem will actuate to automatically open the associated SVC's main circuit breakers in response to signals associated with SVC failure modes that could potentially damage or degrade plant

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.11.2 (continued)

equipment. System functional testing should thus include satisfactory operation of the associated relays and testing of the sensors for which failure modes would be undetected. As a minimum, SVC protection subsystem actuation capability should be verified for response to signals, actual or simulated, corresponding to the following potential SVC failure modes or conditions:

(1) Overvoltage
(2) Undervoltage
(3) Phase Unbalance
(4) Harmonics
(5) Overcurrent

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~The 24-month Frequency is based on the refueling cycle.~~

REFERENCES

1. 10CFR50, Appendix A, GDC 17.

2. USAR, Chapter 8.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The test also verifies the relative accuracy of the instrumentation. 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 Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. USAR, Section 7.6.1.1.
3. USAR, Section 15.4.1.1.

BASES

ACTIONS

A.1 and A.2 (continued)

fuel assemblies. Action must continue until all such control rods are fully inserted. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and, therefore, do not have to be inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

Proper functioning of the refuel position one-rod-out interlock requires the reactor mode switch to be in refuel. During control rod withdrawal in MODE 5, improper positioning of the reactor mode switch could, in some instances, allow improper bypassing of required interlocks. Therefore, this Surveillance imposes an additional level of assurance that the refuel position one-rod-out interlock will be OPERABLE when required. By "locking" the reactor mode switch in the proper position (i.e., removing the reactor mode switch key from the console while the reactor mode switch is positioned in refuel), an additional administrative control is in place to preclude operator errors from resulting in unanalyzed operation.

~~The Frequency of 12 hours is sufficient in view of other administrative controls utilized during refueling operations to ensure safe operation.~~

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 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, this SR has been modified

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1 (continued)

~~The 12 hour Frequency takes into consideration the procedural controls on control rod movement during refueling as well as the redundant functions of the refueling interlocks.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.

2. USAR Section 15.4.1.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2 (continued)

~~The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

With regard to CRD scram accumulator pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 3).

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.

2. USAR, Section 15.4.1.1.

3. Calculation IP-0-0133.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1 (continued)

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

~~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.~~

With regard to RPV water level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 5).

REFERENCES

1. Regulatory Guide 1.25, March 1972.
2. USAR, Section 15.7.4.
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.11.
5. Calculation IP-0-0134.

BASES

ACTIONS

A.1 (continued)

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.~~

With regard to RPV water level values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Ref. 5).

REFERENCES

1. Regulatory Guide 1.25, March 1972.
2. USAR, Section 15.7.4.
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.11.
5. Calculation IP-0-0134.

BASES

ACTIONS

B.1, B.2, B.3, B.4, and B.5 (continued)

would not be expected to result in the immediate release of appreciable fission products to the containment atmosphere. Actions must continue until all requirements of this Condition are satisfied.

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 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.

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

SURVEILLANCE REQUIREMENTS

SR 3.9.8.1

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

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 5.4.7.

BASES

ACTIONS

B.1, B.2, B.3, and B.4 (continued)

required component is inoperable, then it must be restored to OPERABLE status. In this case, the Surveillances may need to be performed to restore the component to OPERABLE status. In addition, at least one door in the upper containment personnel air lock must be closed. The closed air lock door completes the boundary for control of potential radioactive releases. With the appropriate administrative controls however, the closed door can be opened intermittently for entry and exit. This allowance is acceptable due to the need for containment access and due to the slow progression of events which may result from inadequate decay heat removal. Loss of decay heat removal would not be expected to result in the immediate release of appreciable fission products to the containment atmosphere. Actions must continue until all requirements of this Condition are satisfied.

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES (continued)

ACTIONS

A.1, A.2, A.3.1, and A.3.2

These Required Actions are provided to restore compliance with the Technical Specifications overridden by this Special Operations LCO. Restoring compliance will also result in exiting the Applicability of this Special Operations LCO.

All CORE ALTERATIONS except control rod insertion, if in progress, are immediately suspended in accordance with Required Action A.1, and all insertable control rods in core cells that contain one or more fuel assemblies are fully inserted within 1 hour, in accordance with Required Action A.2. This will preclude potential mechanisms that could lead to criticality. Suspension of CORE ALTERATIONS shall not preclude the completion of movement of a component to a safe condition. Placing the reactor mode switch in the shutdown position will ensure that all inserted control rods remain inserted and result in operation in accordance with 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 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 (by a second licensed operator or other technically qualified member of the unit technical staff) to ensure that the operational requirements continue to be met. ~~The Surveillances performed at the 12 hour and 24 hour~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1 and SR 3.10.2.2 (continued)

~~Frequencies are intended to provide appropriate assurance that each operating shift is aware of and verify compliance with these Special Operations LCO requirements.~~

REFERENCES

1. USAR, Section 7.6.1.1.

2. USAR, Section 15.4.1.1.

BASES

ACTIONS

A.1 (continued)

of any other LCO's Required Action to insert all control rods. This Required Action includes exiting this Special Operations Applicability LCO by returning the reactor mode switch to the shutdown position. A second Note has been added, which clarifies that this Required Action is only applicable if the requirements not met are for an affected LCO.

A.2.1 and A.2.2

Required Actions A.2.1 and A.2.2 are alternative Required Actions that can be taken instead of Required Action A.1 to restore compliance with the normal MODE 3 requirements, thereby exiting this Special Operations LCO's Applicability. Actions must be initiated immediately to insert all insertable control rods. Actions must continue until all such control rods are fully inserted. Placing the reactor mode switch in the shutdown position will ensure that all inserted rods remain inserted and restore operation in accordance with Table 1.1-1. The allowed Completion Time of 1 hour to place the reactor mode switch in the shutdown position provides sufficient time to normally insert the control rods.

SURVEILLANCE REQUIREMENTS

SR 3.10.3.1, SR 3.10.3.2, and SR 3.10.3.3

The other LCOs made applicable in this Special Operations LCO are required to have their Surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed while the scram function for the withdrawn rod is not available, periodic verification in accordance with SR 3.10.3.2 is required to preclude the possibility of criticality. SR 3.10.3.2 has been modified by a Note, which clarifies that this SR is not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements, since SR 3.10.3.2 demonstrates that the alternative LCO 3.10.3.d.2 requirements are satisfied. Also, SR 3.10.3.3 verifies that all control rods other than the control rod being withdrawn are fully inserted. ~~The 24 hour Frequency is acceptable because of the administrative~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.3.1, SR 3.10.3.2, and SR 3.10.3.3 (continued)

~~controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardware interlocks that preclude additional control rod withdrawals.~~

REFERENCES

1. USAR, Section 15.4.1.1.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.4.1, SR 3.10.4.2, SR 3.10.4.3, and SR 3.10.4.4

The other LCOs made applicable by this Special Operations LCO are required to have their associated Surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed while the scram function for the withdrawn rod is not available, periodic verification is required to ensure that the possibility of criticality remains precluded. The control rods can be hydraulically disarmed by closing the drive water and exhaust water isolation valves. Electrically, the control rods can be disarmed by disconnecting power from all four directional control valve solenoids. 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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

SR 3.10.4.2 and SR 3.10.4.4 have been modified by Notes, which clarify that these SRs are not required to be met if the alternative requirements demonstrated by SR 3.10.4.1 are satisfied.

REFERENCES

1. USAR, Section 15.4.1.1.

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 (continued)

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 15.4.1.1.

BASES (continued)

APPLICABILITY

Operation in MODE 5 is controlled by existing LCOs. The exceptions from other LCO requirements (e.g., the ACTIONS of LCO 3.9.3, LCO 3.9.4 or LCO 3.9.5) allowed by this Special Operations LCO are appropriately controlled by requiring all fuel to be removed from cells whose "full in" indicators are allowed to be bypassed.

ACTIONS

A.1, A.2, A.3.1, and A.3.2

If one or more of the requirements of this Special Operations LCO are not met, the immediate implementation of these Required Actions commences activities which will restore operation consistent with the normal requirements for refueling (i.e., all control rods inserted in core cells containing one or more fuel assemblies) or with the exceptions granted by this Special Operations LCO. The Completion Times are intended to require that these Required Actions be implemented in a very short time and carried through in an expeditious manner.

SURVEILLANCE REQUIREMENTS

SR 3.10.6.1, SR 3.10.6.2, and SR 3.10.6.3

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. ~~The 24 hour Frequency is acceptable, given the administrative controls on fuel assembly and control rod removal, and takes into account other indications of control rod status available in the control room.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. USAR, Section 15.4.1.1.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.8.1 SR 3.10.8.2 and SR 3.10.8.3

The other LCOs made applicable in this Special Operations LCO are required to have applicable Surveillances met to establish that this Special Operations LCO is being met. However, the control rod withdrawal sequences during the SDM tests may be enforced by the RPC (LCO 3.3.2.1, Function 1b, MODE 2 requirements) or by a second licensed operator or other qualified member of the technical staff. As noted, either the applicable SRs for the RPC (LCO 3.3.2.1) must be satisfied according to the applicable Frequencies (SR 3.10.8.2) or the proper movement of control rods must be verified (SR 3.10.8.3). This latter verification (i.e., SR 3.10.8.3) must be performed during control rod movement to prevent deviations from the specified sequence. These surveillances provide adequate assurance that the specified test sequence is being followed.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. ~~The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to CRD charging water header pressure values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is not considered to be a nominal value with respect to instrument uncertainties. This requires additional margin to be added to the limit to compensate for instrument uncertainties, for implementation in the associated plant procedures (Ref. 3).

REFERENCES

1. NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel, GESTAR II" (latest approved revision).

2. USAR, Section 15.4.9.

3. Calculation IP-0-0136.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.10.9.1 and SR 3.10.9.2

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.~~

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

With regard to THERMAL POWER and reactor coolant temperature values obtained pursuant to this SR, as read from plant indication instrumentation, the specified limit is considered to be a nominal value and therefore does not require compensation for instrument indication uncertainties (Refs. 2, 3).

REFERENCES

1. USAR, Section 6.3.3.

2. Calculation IP-0-0137.

3. Calculation IP-0-0138.

BASES (continued)

ACTIONS

A Note has been provided to modify the ACTIONS related to a single control rod withdrawal while in MODE 5. Section 1.3, Completion Times, specifies once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for each requirement of the LCO not met provide appropriate compensatory measures for separate requirements that are not met. As such, a Note has been provided that allows separate Condition entry for each requirement of the LCO.

A.1 and A.2

If one or more of the requirements specified in this Special Operations LCO are not met, all CORE ALTERATIONS except control rod insertion, if in progress, must be immediately suspended in accordance with Required Action A.1, and actions must be initiated immediately to fully insert all control rods in accordance with Required Action A.2. This will preclude potential mechanisms that could lead to criticality. Suspension of CORE ALTERATIONS shall not preclude the completion of movement of a component to a safe condition and actions to fully insert all insertable control rods must continue until all control rods are fully inserted.

SURVEILLANCE REQUIREMENTS

SR 3.10.10.1 and SR 3.10.10.2

Verification that all the control rods, other than the control rod withdrawn for testing, are fully inserted is required to ensure the SDM is within limits. Verification that no other CORE ALTERATIONS are being made is required to ensure the assumptions of the safety analyses are satisfied.

The Frequency may be based on factors such as operating experience, equipment reliability, or plant risk, and is controlled under the Surveillance Frequency Control Program.

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~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardware interlocks that preclude additional control rod withdrawals.~~

REFERENCES

1. USAR, Section 15.4.1.1.

| Technical Specification Section Title/Surveillance Description[1] | TSTF-425 | CPS |
|---|---|---|
| **Control Rod Operability** | **3.1.3** | **3.1.3** |
| Control rod position | 3.1.3.1 | 3.1.3.1 |
| Notch test - fully withdrawn control rod one notch | 3.1.3.2 | 3.1.3.3 |
| Notch test - partially withdrawn control rod one notch | 3.1.3.3 | 3.1.3.3 |
| **Control Rod Scram Times** | **3.1.4** | **3.1.4** |
| Scram time testing | 3.1.4.2 | 3.1.4.2 |
| **Control Rod Scram Accumulators** | **3.1.5** | **3.1.5** |
| Control rod scram accumulator pressure | 3.1.5.1 | 3.1.5.1 |
| **Rod Pattern Control** | **3.1.6** | **3.1.6** |
| Verify rod position sequence | 3.1.6.1 | 3.1.6.1 |
| **Standby Liquid Control (SLC) System** | **3.1.7** | **3.1.7** |
| Volume of sodium pentaborate | 3.1.7.1 | 3.1.7.1 |
| Temperature of sodium pentaborate solution | 3.1.7.2 | 3.1.7.2 |
| Temperature of pump suction piping | 3.1.7.3 | 3.1.7.3 |
| Continuity of explosive charge | 3.1.7.4 | 3.1.7.4 |
| Concentration of boron solution | 3.1.7.5 | 3.1.7.5 |
| Manual/power operated valve position | 3.1.7.6 | 3.1.7.6 |
| Pump flow rate | 3.1.7.7 | 3.1.7.7[2] |
| Flow through one SLC subsystem | 3.1.7.8 | 3.1.7.8 |
| Heat traced piping is unblocked | 3.1.7.9 | 3.1.7.9 |
| **Scram Discharge Volume (SDV) Vent & Drain Valves** | **3.1.8** | **3.1.8** |
| Each SDV vent & drain valve open | 3.1.8.1 | 3.1.8.1 |
| Cycle each SDV vent & drain valve fully closed/fully open position | 3.1.8.2 | 3.1.8.2 |
| Each SDV vent & drain valve closes on receipt of scram | 3.1.8.3 | 3.1.8.3 |
| **Average Planar Linear Heat Generation Rate (APLHGR)** | **3.2.1** | **3.2.1** |
| APLHGR less than or equal to limits | 3.2.1.1 | 3.2.1.1 |
| **Minimum Critical Power Ratio (MCPR)** | **3.2.2** | **3.2.2** |
| MCPR greater than or equal to limits | 3.2.2.1 | 3.2.2.1 |
| **Linear Heat Generation Rate (LHGR)** | **3.2.3** | **3.2.3** |
| LHGR less than or equal to limits | 3.2.3.1 | 3.2.3.1 |
| **Average Power Range Monitor (APRM) Gain & Setpoints** | **3.2.4** | **------** |
| MFLPD is within limits | 3.2.4.1 | ------ |
| APRM setpoints or gain are adjusted for calculated MFLPD | 3.2.4.2 | ------ |
| **Reactor Protection System (RPS) Instrumentation** | **3.3.1.1** | **3.3.1.1** |
| Channel Check | 3.3.1.1.1 | 3.3.1.1.1 |
| Absolute diff. between APRM channels & calculated power | 3.3.1.1.2 | 3.3.1.1.2 |
| Adjust channel to conform to calibrated flow | 3.3.1.1.3 | 3.3.1.1.3 |
| Channel Functional Test (after entering Mode 2) | 3.3.1.1.4 | 3.3.1.1.4 |
| Channel Functional Test (weekly) | 3.3.1.1.5 | 3.3.1.1.5 |
| IRM/APRM channel overlap | --------- | 3.3.1.1.7 |
| Calibrate local power range monitors | 3.3.1.1.6 | 3.3.1.1.8 |
| Channel Functional Test (quarterly) | 3.3.1.1.7 | 3.3.1.1.9 |
| Calibrate trip units (quarterly) | 3.3.1.1.8 | 3.3.1.1.10 |
| Channel Calibration | 3.3.1.1.9 | 3.3.1.1.11 |
| Channel Functional Test | 3.3.1.1.10 | 3.3.1.1.12 |

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| Channel Calibration | 3.3.1.1.11 | 3.3.1.1.13 |
| Verify APRM Flow Biased STP – High time constant | 3.3.1.1.12 | 3.3.1.1.14 |
| Logic System Functional Test | 3.3.1.1.13 | 3.3.1.1.15 |
| Verify TSV/TCV closure/Trip Oil Press-Low Not Bypassed | 3.3.1.1.14 | 3.3.1.1.16 |
| Verify RPS Response Time | 3.3.1.1.15 | 3.3.1.1.17 |
| **Source Range Monitor (SRM) Instrumentation** | **3.3.1.2** | **3.3.1.2** |
| Channel Check | 3.3.1.2.1 | 3.3.1.2.1 |
| Verify Operable SRM Detector | 3.3.1.2.2 | 3.3.1.2.2 |
| Channel Check | 3.3.1.2.3 | 3.3.1.2.3 |
| Verify count rate | 3.3.1.2.4 | 3.3.1.2.4 |
| Channel Functional Test (Mode 5) (7 days) | 3.3.1.2.5 | --------- |
| Channel Functional Test (Modes 2, 3, 4) (31 days) | 3.3.1.2.6 | 3.3.1.2.5 |
| Channel Calibration | 3.3.1.2.7 | 3.3.1.2.6 |
| **OPRM Instrumentation** | **----------** | **3.3.1.3** |
| Channel Functional Test | ---------- | 3.3.1.3.1 |
| Calibrate LPRMs | ---------- | 3.3.1.3.2 |
| Channel Calibration | ---------- | 3.3.1.3.3 |
| Logic System Functional Test | ---------- | 3.3.1.3.4 |
| Verify OPRM not bypassed | ---------- | 3.3.1.3.5 |
| Verify RPS Response Time | ---------- | 3.3.1.3.6 |
| **Control Rod Block Instrumentation** | **3.3.2.1** | **3.3.2.1** |
| Channel Functional Test (> 70% RTP) | 3.3.2.1.1 | 3.3.2.1.1 |
| Channel Functional Test (>35% RTP, ≤70% RTP) | 3.3.2.1.2 | 3.3.2.1.2 |
| Channel Functional Test (≤10% RTP in MODE 2) | 3.3.2.1.3 | 3.3.2.1.3 |
| Channel Functional Test (≤10% RTP in MODE 1) | 3.3.2.1.4 | 3.3.2.1.4 |
| Calibrate trip units | 3.3.2.1.5 | 3.3.2.1.5 |
| Verify RWL high power Function not bypassed | 3.3.2.1.6 | 3.3.2.1.6 |
| Channel Calibration | 3.3.2.1.7 | 3.3.2.1.7 |
| Channel Functional Test | 3.3.2.1.8 | 3.3.2.1.8 |
| **Post Accident Monitor (PAM) Instrumentation** | **3.3.3.1** | **3.3.3.1** |
| Channel Check | 3.3.3.1.1 | 3.3.3.1.1 |
| Calibration | 3.3.3.1.2 | 3.3.3.1.2 |
| **Remote Shutdown System** | **3.3.3.2** | **3.3.3.2** |
| Channel Check | 3.3.3.2.1 | 3.3.3.2.1 |
| Verify control circuit and transfer switch capable of function | 3.3.3.2.2 | 3.3.3.2.2 |
| Channel Calibration | 3.3.3.2.3 | 3.3.3.2.3 |
| **End-of-Cycle-Recirculation Pump Trip (RPT) Instrumentation** | **3.3.4.1** | **3.3.4.1** |
| Channel Functional Test | 3.3.4.1.1 | 3.3.4.1.1 |
| Calibrate trip units | 3.3.4.1.2 | --------- |
| Channel Calibration | 3.3.4.1.3 | 3.3.4.1.2 |
| Logic System Functional Test | 3.3.4.1.4 | 3.3.4.1.3 |
| Verify TSV/TCV Closure/Trip Oil Press-Low Not Bypassed | 3.3.4.1.5 | 3.3.4.1.4 |
| Verify EOC-RPT System Response Time | 3.3.4.1.6 | 3.3.4.1.5 |
| Determine RPT breaker interruption time | 3.3.4.1.7 | --------- |

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| **Anticipated Trip Without Scram-RPT Instrumentation** | **3.3.4.2** | **3.3.4.2** |
| Channel Check | 3.3.4.2.1 | 3.3.4.2.1 |
| Channel Functional Test | 3.3.4.2.2 | 3.3.4.2.3 |
| Calibrate trip units | 3.3.4.2.3 | 3.3.4.2.2 |
| Channel Calibration | 3.3.4.2.4 | 3.3.4.2.4 |
| Logic System Functional Test | 3.3.4.2.5 | 3.3.4.2.5 |
| **Emergency Core Cooling System (ECCS) Instrumentation** | **3.3.5.1** | **3.3.5.1** |
| Channel Check | 3.3.5.1.1 | 3.3.5.1.1 |
| Channel Functional Test | 3.3.5.1.2 | 3.3.5.1.2 |
| Calibrate trip units | 3.3.5.1.3 | 3.3.5.1.3 |
| Channel Calibration | 3.3.5.1.4 | 3.3.5.1.4 |
| Channel Calibration | 3.3.5.1.5 | 3.3.5.1.6 |
| Logic System Functional Test | 3.3.5.1.6 | 3.3.5.1.5 |
| Verify ECCS Response Time | 3.3.5.1.7 | 3.5.1.8 |
| **Reactor Core Isolation Cooling (RCIC) System Instrumentation** | **3.3.5.2** | **3.3.5.2** |
| Channel Check | 3.3.5.2.1 | 3.3.5.2.1 |
| Channel Functional Test | 3.3.5.2.2 | 3.3.5.2.2 |
| Calibrate trip units | 3.3.5.2.3 | 3.3.5.2.3 |
| Channel Calibration | 3.3.5.2.4 | 3.3.5.2.4<br>3.3.5.2.6 |
| Logic System Functional Test | 3.3.5.2.5 | 3.3.5.2.5 |
| **Primary Containment Isolation Instrumentation** | **3.3.6.1** | **3.3.6.1** |
| Channel Check | 3.3.6.1.1 | 3.3.6.1.1 |
| Channel Functional Test | 3.3.6.1.2 | 3.3.6.1.2 |
| Calibrate trip units | 3.3.6.1.3 | 3.3.6.1.3 |
| Channel Calibration | 3.3.6.1.4 | 3.3.6.1.4 |
| Channel Calibration | 3.3.6.1.5 | 3.3.6.1.5<br>3.3.6.1.8 |
| Logic System Functional Test | 3.3.6.1.6 | 3.3.6.1.6 |
| Verify Isolation Response Time | 3.3.6.1.7 | 3.3.6.1.7 |
| **Secondary Containment Isolation Instrumentation** | **3.3.6.2** | **3.3.6.2** |
| Channel Check | 3.3.6.2.1 | 3.3.6.2.1 |
| Channel Functional Test | 3.3.6.2.2 | 3.3.6.2.2 |
| Calibrate trip units | 3.3.6.2.3 | 3.3.6.2.3 |
| Channel Calibration | 3.3.6.2.4 | 3.3.6.2.4<br>3.3.6.2.6 |
| Logic System Functional Test | 3.3.6.2.5 | 3.3.6.2.5 |
| Verify Isolation Response Time | 3.3.6.2.6 | ---------- |
| **RHR Containment Spray System Instrumentation** | **3.3.6.3** | **3.3.6.3** |
| Channel Check | 3.3.6.3.1 | 3.3.6.3.1 |
| Channel Functional Test | 3.3.6.3.2 | 3.3.6.3.2 |
| Calibrate trip units | 3.3.6.3.3 | 3.3.6.3.3 |
| Channel Calibration – Quarterly [CPS – 24 months] | 3.3.6.3.4 | 3.3.6.3.4 |
| Channel Calibration | 3.3.6.3.5 | 3.3.6.3.6 |
| Logic System Functional Test | 3.3.6.3.6 | 3.3.6.3.5 |

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| **Suppression Pool Makeup (SPMU) System Instrumentation** | **3.3.6.4** | **3.3.6.4** |
| Channel Check | 3.3.6.4.1 | 3.3.6.4.1 |
| Channel Functional Test | 3.3.6.4.2 | 3.3.6.4.2 |
| Calibrate trip unit | 3.3.6.4.3 | 3.3.6.4.3 |
| Calibrate analog comparator unit | --------- | 3.3.6.4.4 |
| Channel Calibration - Quarterly | 3.3.6.4.4 | 3.3.6.4.5 |
| Channel Calibration | 3.3.6.4.5 | 3.3.6.4.6<br>3.3.6.4.8 |
| Logic System Functional Test | 3.3.6.4.6 | 3.3.6.4.7 |
| **Relief and LLS Instrumentation** | **3.3.6.5** | **3.3.6.5** |
| Channel Functional Test | 3.3.6.5.1 | 3.3.6.5.1 |
| Calibrate trip unit | 3.3.6.5.2 | 3.3.6.5.2 |
| Channel Calibration | 3.3.6.5.3 | 3.3.6.5.3 |
| Logic System Functional Test | 3.3.6.5.4 | 3.3.6.5.4 |
| **CRFA [CPS – Control Room Ventilation] System Instrumentation** | **3.3.7.1** | **3.3.7.1** |
| Channel Check | 3.3.7.1.1 | 3.3.7.1.1 |
| Channel Functional Test | 3.3.7.1.2 | 3.3.7.1.2 |
| Calibrate trip units | 3.3.7.1.3 | --------- |
| Channel Calibration | 3.3.7.1.4 | 3.3.7.1.3 |
| Logic System Functional Test | 3.3.7.1.5 | --------- |
| **Loss of Power (LOP) Instrumentation** | **3.3.8.1** | **3.3.8.1** |
| Channel Check | 3.3.8.1.1 | ---------- |
| Channel Functional Test | 3.3.8.1.2 | 3.3.8.1.2 |
| Channel Calibration | 3.3.8.1.3 | 3.3.8.1.3 |
| Logic System Functional Test | 3.3.8.1.4 | 3.3.8.1.4 |
| **RPS Electric Power Monitoring** | **3.3.8.2** | **3.3.8.2** |
| Channel Functional Test | 3.3.8.2.1 | 3.3.8.2.1 |
| Channel Calibration | 3.3.8.2.2 | 3.3.8.2.2 |
| System functional test | 3.3.8.2.3 | 3.3.8.2.3 |
| **Recirculation Loops Operating** | **3.4.1** | **3.4.1** |
| Recirc loop jet pump flow mismatch with both loops operating | 3.4.1.1 | 3.4.1.1 |
| **Flow Control Valves** | **3.4.2** | **3.4.2** |
| Verify FCV fails "as is" | 3.4.2.1 | 3.4.2.1 |
| Verify average rate of movement | 3.4.2.2 | --------- |
| **Jet Pumps** | **3.4.3** | **3.4.3** |
| Criteria satisfied for each operating recirc loop | 3.4.3.1 | 3.4.3.1 |
| **Safety/Relief Valves (SRVs)** | **3.4.4** | **3.4.4** |
| Safety function lift setpoints | 3.4.4.1 | 3.4.4.1[2] |
| Verify relief function SRVs actuate automatically | 3.4.4.2 | 3.4.4.2 |
| Verify SRVs open when manually acturated | 3.4.4.3 | 3.4.4.3 |
| **Reactor Coolant System (RCS) Operational Leakage** | **3.4.5** | **3.4.5** |
| RCS unidentified and total leakage increase within limits | 3.4.5.1 | 3.4.5.1 |
| **RCS Pressure Isolation Valve (PIV) Leakage** | **3.4.6** | **3.4.6** |
| Equivalent leakage of each PIV | 3.4.6.1 | 3.4.6.1[2] |

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| **RCS Leakage Detection Instrumentation** | **3.4.77** | **3.4.7** |
| Channel Check | 3.4.7.1 | 3.4.7.1 |
| Channel Functional Test | 3.4.7.2 | 3.4.7.2 |
| Channel Calibration | 3.4.7.3 | 3.4.7.3 |
| **RCS Specific Activity** | **3.4.8** | **3.4.8** |
| Dose Equivalent I-131 specific activity | 3.4.8.1 | 3.4.8.1 |
| **Residual Heat Removal (RHR) Shutdown Cooling- Hot Shutdown** | **3.4.9** | **3.4.9** |
| One subsystem operating | 3.4.9.1 | 3.4.9.1 |
| **RHR Shutdown Cooling - Cold Shutdown** | **3.4.10** | **3.4.10** |
| One subsystem operating | 3.4.10.1 | 3.4.10.1 |
| **RCS Pressure/Temperature Limit** | **3.4.11** | **3.4.11** |
| RCS pressure, temperature, heatup and cooldown rates | 3.4.11.1 | 3.4.11.1 |
| RPV flange/head flange temperatures (tensioning head bolt stud) | 3.4.11.7 | 3.4.11.5 |
| RPV flange/head flange temperatures (after RCS temp ≤ 80°F) | 3.4.11.8 | 3.4.11.6 |
| RPV flange/head flange temperatures (after RCS temp ≤ 100°F [CPS - ≤90°F]) | 3.4.11.9 | 3.4.11.7 |
| **Reactor Steam Dome Pressure** | **3.4.12** | **3.4.12** |
| Verify reactor steam dome pressure | 3.4.12.1 | 3.4.12.1 |
| **ECCS - Operating** | **3.5.1** | **3.5.1** |
| Verify injection/spray piping filled with water | 3.5.1.1 | 3.5.1.1 |
| Verify each valve in flow path is in correct position | 3.5.1.2 | 3.5.1.2 |
| Verify ADS header pressure | 3.5.1.3 | 3.5.1.3 |
| Verify ECCS pump flow rate | 3.5.1.4 | 3.5.1.4[2] |
| Verify ECCS injection/spray valves actuate automatically | 3.5.1.5 | 3.5.1.5 |
| Verify ADS actuates on initiation signal | 3.5.1.6 | 3.5.1.6 |
| Verify each ADS valve opens when manually actuated | 3.5.1.7 | 3.5.1.7 |
| **ECCS - Shutdown** | **3.5.2** | **3.5.2** |
| Verify suppression pool water level | 3.5.2.1 | 3.5.2.1 |
| Verify, for HPCS, suppression pool water level and CST water level | 3.5.2.2 | 3.5.2.2 |
| Verify ECCS piping filled with water | 3.5.2.3 | 3.5.2.3 |
| Verify each valve in flow path is in correct position | 3.5.2.4 | 3.5.2.4 |
| Verify each ECCS pump develops flow | 3.5.2.5 | 3.5.2.5[2] |
| Verify ECCS actuates on initiation signal | 3.5.2.6 | 3.5.2.6 |
| **RCIC System** | **3.5.3** | **3.5.3** |
| Verify RCIC piping filled with water | 3.5.3.1 | 3.5.3.1 |
| Verify each valve in flow path is in correct position | 3.5.3.2 | 3.5.3.2 |
| Verify RCIC flow rate (Rx press < 1045, > 945) | 3.5.3.3 | 3.5.3.3 |
| Verify RCIC flow rate (Rx press < 165 [CPS ≤150 psig]) | 3.5.3.4 | 3.5.3.4 |
| Verify RCIC actuates on initiation signal | 3.5.3.5 | 3.5.3.5 |
| **Primary Containment Air Lock** | **3.6.1.2** | **3.6.1.2** |
| Verify air lock seal air flask pressure | 3.6.1.2.2 | --------- |
| Verify only one door can be opened | 3.6.1.2.3 | 3.6.1.2.2 |
| Verify air lock seal pneumatic system pressure decay rate | 3.6.1.2.4 | --------- |

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| **Primary Containment Isolation Valves (PCIVs)** | **3.6.1.3** | **3.6.1.3** |
| Verify purge valve is closed except one valve in a penetration | 3.6.1.3.1 | --------- |
| Verify each 20 inch [CPS – 36 inch] purge valve is closed | 3.6.1.3.2 | 3.6.1.3.1 |
| Verify each manual PCIV outside containment is closed | 3.6.1.3.3 | 3.6.1.3.2 |
| Verify isolation time of each power operated PCIV | 3.6.1.3.5 | 3.6.1.3.4[2] |
| Perform leakage rate testing on each PC purge valve | 3.6.1.3.6 | 3.6.1.3.5[3] |
| Verify isolation time of MSIVs | 3.6.1.3.7 | 3.6.1.3.6[2] |
| Verify automatic PCIV actuates to isolation position | 3.6.1.3.8 | 3.6.1.3.7 |
| Verify each purge valve is blocked | 3.6.1.3.12 | ---------- |
| Verify excess flow check valve isolation valves actuate | --------- | 3.6.1.3.12 |
| **Primary Containment Pressure** | **3.6.1.4** | **3.6.1.4** |
| Verify primary containment to secondary containment differential pressure | 3.6.1.4.1 | 3.6.1.4.1 |
| **Primary Containment Air Temperature** | **3.6.1.5** | **3.6.1.5** |
| Verify average air temperature is within limit | 3.6.1.5.1 | 3.6.1.5.1 |
| **LLS Valves** | **3.6.1.6** | **3.6.1.6** |
| Verify each LLS valve opens when manually actuated | 3.6.1.6.1 | 3.6.1.6.1 |
| Verify LLS system actuates on initiation signal | 3.6.1.6.2 | 3.6.1.6.2 |
| **RHR Containment Spray** | **3.6.1.7** | **3,6,1,7** |
| Verify each system manual valve position | 3.6.1.7.1 | 3.6.1.7.1 |
| Verify pump flow rate | 3.6.1.7.2 | 3.6.1.7.2[2] |
| Verify automatic valves actuate on initiation signal | 3.6.1.7.3 | 3.6.1.7.3 |
| Verify spray nozzles unobstructed | 3.6.1.7.4 | 3.6.1.7.4[4] |
| **Penetration Valve Leakage Control System (PVLCS)** | **3.6.1.8** | **------** |
| Verify air pressure | 3.6.1.8.1 | --------- |
| Perform system functional test | 3.6.1.8.2 | --------- |
| **Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)** | **3.6.1.9** | **-------** |
| Operate each MSIV LCS blower | 3.6.1.9.1 | ---------- |
| Verify continuity of inboard MSIV LCS heater element | 3.6.1.9.2 | ---------- |
| Perform functional test of each MSIV LCS subsystem | 3.6.1.9.3 | ---------- |
| **Feedwater Leakage Control System (FWLCS)** | **------** | **3.6.1.9** |
| Perform system functional test | --------- | 3.6.1.9.1 |
| **Suppression Pool Average Temperature** | **3.6.2.1** | **3.6.2.1** |
| Verify suppression pool average temperature within limits | 3.6.2.1.1 | 3.6.2.1.1 |
| **Suppression Pool Water Level** | **3.6.2.2** | **3.6.2.2** |
| Verify suppression pool water level within limits | 3.6.2.2.1 | 3.6.2.2.1 |
| **RHR Suppression Pool Cooling** | **3.6.2.3** | **3.6.2.3** |
| Verify each valve in flow path is in correct position | 3.6.2.3.1 | 3.6.2.3.1 |
| Verify each RHR pump develops flow rate | 3.6.2.3.2 | 3.6.2.3.2[2] |
| **Suppression Pool Makeup (SPMU) System** | **3.6.2.4** | **3.6.2.4** |
| Verify upper containment pool water level | 3.6.2.4.1 | 3.6.2.4.1 |
| Verify upper containment pool water temperature | 3.6.2.4.2 | 3.6.2.4.2 |
| Verify each system manual valve position | 3.6.2.4.3 | 3.6.2.4.3 |
| Verify upper containment pool gates in place or removed | 3.6.2.4.4 | --------- |

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| Verify automatic valves actuate on initiation signal | 3.6.2.4.5 | 3.6.2.4.4 |
| **Primary Containment and Drywell Hydrogen Igniters** | **3.6.3.1** | **3.6.3.2** |
| Energize each hydrogen igniter division | 3.6.3.1.1 | 3.6.3.2.1 |
| Energize each hydrogen igniter division (4 or more igniters inoperable) | 3.6.3.1.2 | 3.6.3.2.2 |
| Verify igniter current draw | 3.6.3.1.3 | 3.6.3.2.3 |
| Verify igniter current draw | 3.6.3.1.4 | 3.6.3.2.4 |
| **Drywell Purge System [CPS – Containment/Drywell Hydrogen Mixing System** | **3.6.3.2** | **3.6.3.3** |
| Operate each system | 3.6.3.2.1 | 3.6.3.3.1 |
| Verify flow rate | 3.6.3.2.2 | 3.6.3.3.2 |
| **Secondary Containment** | **3.6.4.1** | **3.6.4.1** |
| Verify SC vacuum is > 0.25 inch of vacuum water gauge | 3.6.4.1.1 | 3.6.4.1.1 |
| Verify all SC equipment hatches closed and sealed | 3.6.4.1.2 | 3.6.4.1.2 |
| Verify one SC access door in each opening is closed | 3.6.4.1.3 | 3.6.4.1.3 |
| Verify SC drawn down using one SGTS | 3.6.4.1.4 | 3.6.4.1.4 |
| Verify SC can be maintained using one SGTS | 3.6.4.1.5 | 3.6.4.1.5 |
| **Secondary Containment Isolation Valves (SCIVs) [CPS – Dampers (SCIDs)]** | **3.6.4.2** | **3.6.4.2** |
| Verify each SC isolation manual valve is closed | 3.6.4.2.1 | 3.6.4.2.1 |
| Verify isolation time of each SCIV | 3.6.4.2.2 | 3.6.4.2.2 |
| Verify each automatic SCIV actuates to isolation position | 3.6.4.2.3 | 3.6.4.2.3 |
| **Standby Gas Treatment (SGT) System** | **3.6.4.3** | **3.6.4.3** |
| Operate each SGT subsystem with heaters operating | 3.6.4.3.1 | 3.6.4.3.1 |
| Verify each SGT subsystem actuates on initiation signal | 3.6.4.3.3 | 3.6.4.3.3 |
| Verify each SGT filter cooler bypass damper can be opened | 3.6.4.3.4 | 3.6.4.3.4 |
| **Drywell** | **3.6.5.1** | **3.6.5.1** |
| Verify bypass leakage | 3.6.5.1.1 | 3.6.5.1.3 |
| Visually inspect drywell surfaces | 3.6.5.1.2 | 3.6.5.1.4[5] |
| Perform drywell air lock leakage rate test | --------- | 3.6.5.1.2 |
| **Drywell Air Lock** | **3.6.5.2** | **3.6.5.2** |
| Verify seal leakage rate | 3.6.5.2.1 | --------- |
| Verify seal air flask pressure | 3.6.5.2.2 | --------- |
| Verify only one door can be opened at a time | 3.6.5.2.3 | 3.6.5.2.1 |
| Verify drywell air lock leakage rate | 3.6.5.2.4 | --------- |
| Verify seal pneumatic pressure decay rate | 3.6.5.2.5 | --------- |
| **Drywell Isolation Valves** | **3.6.5.3** | **3.6.5.3** |
| Verify purge isolation valve sealed closed | 3.6.5.3.1 | 3.6.5.3.1 |
| Verify purge isolation valve closed | 3.6.5.3.2 | 3.6.5.3.2 |
| Verify automatic isolation valves actuate on isolation signal | 3.6.5.3.5 | 3.6.5.3.5 |
| Verify purge isolation valves blocked | 3.6.5.3.6 | --------- |
| **Drywell Pressure** | **3.6.5.4** | **3.6.5.4** |
| Verify drywell-to-primary containment differential pressure | 3.6.5.4.1 | 3.6.5.4.1 |
| **Drywell Air Temperature** | **3.6.5.5** | **3.6.5.5** |
| Verify average air temperature | 3.6.5.5.1 | 3.6.5.5.1 |

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|---|---|---|
| **Drywell Vacuum Relief System [CPS – Drywell Post-LOCA Vacuum Relief Valve]** | **3.6.5.6** | **3.6.5.6** |
| Verify vacuum breakers and isolation valves closed | 3.6.5.6.1 | 3.6.5.6.1 |
| Perform functional test | 3.6.5.6.2 | 3.6.5.6.2 |
| Verify opening setpoint | 3.6.5.6.3 | 3.6.5.6.3 |
| **Standby Service Water (SSW) [CPS – Division 1 and 2 Shutdown Service Water (SX)] System and Ultimate Heat Sink (UHS)** | **3.7.1** | **3.7.1** |
| Verify water level in cooling tower basin | 3.7.1.1 | --------- |
| Verify water level in pump well of pump structure | 3.7.1.2 | --------- |
| Verify average water temperature of heat sink | 3.7.1.3 | --------- |
| Operate each cooling tower fan | 3.7.1.4 | --------- |
| Verify each SSW valve in flow path is in correct position | 3.7.1.5 | 3.7.1.2 |
| Verify SSW actuates on initiation signal | 3.7.1.6 | 3.7.1.3 |
| **HPCS Service Water System [CPS – Division 3 SX Subsystem]** | **3.7.2** | **3.7.2** |
| Verify water level | 3.7.2.1 | --------- |
| Verify each valve in flow path is in correct position | 3.7.2.2 | 3.7.2.1 |
| Verify system actuates on initiation signal | 3.7.2.3 | 3.7.2.2 |
| **CRFA [CPS – Control Room Ventilation] System** | **3.7.3** | **3.7.3** |
| Operate each subsystem | 3.7.3.1 | 3.7.3.1<br>3.7.3.2 |
| Verify each subsystem actuates on initiation signal | 3.7.3.3 | 3.7.3.4 |
| Verify each subsystem can maintain positive pressure | 3.7.3.4 | --------- |
| **Control Room AC System** | **3.7.4** | **3.7.4** |
| Verify each subsystem has capability to remove heat load | 3.7.4.1 | 3.7.4.1 |
| **Main Condenser Offgas** | **3.7.5** | **3.7.5** |
| Verify gross gamma activity rate of the noble gases | 3.7.5.1 | 3.7.5.1 |
| **Main Turbine Bypass System** | **3.7.6** | **3.7.6** |
| Verify one complete cycle of each main turbine bypass valve | 3.7.6.1 | 3.7.6.1 |
| Perform system functional test | 3.7.6.2 | 3.7.6.2 |
| Verify Turbine Bypass System Response Time within limits | 3.7.6.3 | 3.7.6.3 |
| **Fuel Storage Pool Water Level** | **3.7.7** | **3.7.7** |
| Verify spent fuel storage pool water level | 3.7.7.1 | 3.7.7.1 |
| **AC Sources - Operating** | **3.8.1** | **3.8.1** |
| Verify correct breaker alignment | 3.8.1.1 | 3.8.1.1 |
| Verify each DG starts from standby conditions/steady state | 3.8.1.2 | 3.8.1.2[6] |
| Verify each DG is synchronized and loaded | 3.8.1.3 | 3.8.1.3[6] |
| Verify each day tank level | 3.8.1.4 | 3.8.1.4 |
| Check for and remove accumulated water from day tank | 3.8.1.5 | 3.8.1.5 |
| Verify fuel oil transfer system operates | 3.8.1.6 | 3.8.1.6 |
| Verify each DG starts from standby conditions/quick start | 3.8.1.7 | 3.8.1.7 |
| Verify transfer of power from offsite circuit to alternate circuit | 3.8.1.8 | 3.8.1.8 |
| Verify DG rejects load greater than single largest load | 3.8.1.9 | 3.8.1.9 |
| Verify DG maintains load following load reject | 3.8.1.10 | 3.8.1.10 |
| Verify on loss of offsite power signal | 3.8.1.11 | 3.8.1.11 |

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| Verify DG starts on ECCS initiation signal | 3.8.1.12 | 3.8.1.12 |
| Verify DG automatic trips bypassed on ECCS initiation signal | 3.8.1.13 | 3.8.1.13 |
| Verify each DG operates for > 24 hours | 3.8.1.14 | 3.8.1.14 |
| Verify each DG starts from standby conditions/quick restart | 3.8.1.15 | 3.8.1.15 |
| Verify each DG synchronizes with offsite power | 3.8.1.16 | 3.8.1.16 |
| Verify ECCS initiation signal overrides test mode | 3.8.1.17 | 3.8.1.17 |
| Verify interval between each timed load block | 3.8.1.18 | 3.8.1.18 |
| Verify on LOOP in conjunction with ECCS initiation signal | 3.8.1.19 | 3.8.1.19 |
| Verify simultaneous DG starts | 3.8.1.20 | 3.8.1.20 |
| **Diesel Fuel Oil, Lube Oil, and Starting Air** | **3.8.3** | **3.8.3** |
| Verify fuel oil storage tank volume | 3.8.3.1 | 3.8.3.1 |
| Verify lube oil inventory | 3.8.3.2 | 3.8.3.2 |
| Verify each DG air start receiver pressure | 3.8.3.4 | 3.8.3.1 |
| Check/remove accumulated water from fuel oil storage tank | 3.8.3.5 | 3.8.1.7 |
| **DC Sources – Operating** | **3.8.4** | **3.8.4** |
| Verify battery terminal voltage | 3.8.4.1 | 3.8.4.1 |
| Verify each battery charger supplies amperage | 3.8.4.2 | 3.8.4.2 |
| Verify battery capacity is adequate to maintain emergency loads | 3.8.4.3 | 3.8.4.3 |
| **Battery Parameters** | **3.8.6** | **3.8.6** |
| Verify battery float current | 3.8.6.1 | 3.8.6.1 |
| Verify battery pilot cell voltage | 3.8.6.2 | 3.8.6.2 |
| Verify battery connected cell electrolyte level | 3.8.6.3 | 3.8.6.3 |
| Verify battery pilot cell temperature | 3.8.6.4 | 3.8.6.4 |
| Verify battery connected cell voltage | 3.8.6.5 | 3.8.6.5 |
| Verify battery capacity during performance discharge test | 3.8.6.6 | 3.8.6.6 |
| **Inverters - Operating** | **3.8.7** | **3.8.7** |
| Verify correct inverter voltage, frequency and alignment | 3.8.7.1 | 3.8.7.1 |
| **Inverters - Shutdown** | **3.8.8** | **3.8.8** |
| Verify correct inverter voltage, frequency and alignment | 3.8.8.1 | 3.8.8.1 |
| **Distribution System - Operating** | **3.8.9** | **3.8.9** |
| Verify correct breaker alignment/power to distribution subsystems | 3.8.9.1 | 3.8.9.1 |
| **Distribution System - Shutdown** | **3.8.10** | **3.8.10** |
| Verify correct breaker alignment/power to distribution subsystems | 3.8.10.1 | 3.8.10.1 |
| **Static VAR Compensator (SVC) Protection Systems** | **------** | **3.8.11** |
| Perform visual check | --------- | 3.8.11.1 |
| Perform system functional test | --------- | 3.8.11.2 |
| **Refueling Equipment Interlocks** | **3.9.1** | **3.9.1** |
| Channel Functional Test of refueling equip interlock inputs | 3.9.1.1 | 3.9.1.1 |
| **Refuel Position One-Rod-Out Interlock** | **3.9.2** | **3.9.2** |
| Verify reactor mode switch locked in refuel position | 3.9.2.1 | 3.9.2.1 |
| Perform Channel Functional Test | 3.9.2.2 | 3.9.2.2 |
| **Control Rod Position** | **3.9.3** | **3.9.3** |
| Verify all control rods fully inserted | 3.9.3.1 | 3.9.3.1 |
| **Control Rod Operability - Refuel** | **3.9.5** | **3.9.5** |
| Insert each withdrawn control rod one notch | 3.9.5.1 | 3.9.5.1 |

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|---|---|---|
| Verify each withdrawn control rod scram accumulator press | 3.9.5.2 | 3.9.5.2 |
| **Reactor Pressure Vessel (RPV) Water Level - Irradiated Fuel** | **3.9.6** | **3.9.6** |
| Verify RPV water level | 3.9.6.1 | 3.9.6.1 |
| **Reactor Pressure Vessel (RPV) Water Level - New Fuel** | **3.9.7** | **3.9.7** |
| Verify RPV water level | 3.9.7.1 | 3.9.7.1 |
| **RHR - High Water Level** | **3.9.8** | **3.9.8** |
| Verify one RHR shutdown cooling subsystem operating | 3.9.8.1 | 3.9.8.1 |
| **RHR - Low Water Level** | **3.9.9** | **3.9.9** |
| Verify one RHR shutdown cooling subsystem operating | 3.9.9.1 | 3.9.9.1 |
| **Reactor Mode Switch Interlock Testing** | **3.10.2** | **3.10.2** |
| Verify all control rods fully inserted in core cells | 3.10.2.1 | 3.10.2.1 |
| Verify no core alterations in progress | 3.10.2.2 | 3.10.2.2 |
| **Single Control Rod Withdrawal - Hot Shutdown** | **3.10.3** | **3.10.3** |
| Verify all control rods in five-by-five array are disarmed | 3.10.3.2 | 3.10.3.2 |
| Verify all control rods other than withdrawn rod are fully inserted | 3.10.3.3 | 3.10.3.3 |
| **Single Control Rod Withdrawal - Cold Shutdown** | **3.10.4** | **3.10.4** |
| Verify all control rods in five-by-five array are disarmed | 3.10.4.2 | 3.10.4.2 |
| Verify all control rods other than withdrawn rod are fully inserted | 3.10.4.3 | 3.10.4.3 |
| Verify a control rod withdrawal block is inserted | 3.10.4.4 | 3.10.4.4 |
| **Single Control Rod Drive (CRD) Removal - Refueling** | **3.10.5** | **3.10.5** |
| Verify all control rods other than withdrawn rod are fully inserted | 3.10.5.1 | 3.10.5.1 |
| Verify all control rods in five-by-five array are disarmed | 3.10.5.2 | 3.10.5.2 |
| Verify a control rod withdrawal block is inserted | 3.10.5.3 | 3.10.5.3 |
| Verify no core alterations in progress | 3.10.5.5 | 3.10.5.5 |
| **Multiple CRD Removal-Refuel** | **3.10.6** | **3.10.6** |
| Verify four fuel assemblies removed from core cells | 3.10.6.1 | 3.10.6.1 |
| Verify all other rods in core cells inserted | 3.10.6.2 | 3.10.6.2 |
| Verify fuel assemblies being loaded comply with reload sequence | 3.10.6.3 | 3.10.6.3 |
| **Shutdown Margin Test - Refueling** | **3.10.8** | **3.10.8** |
| Verify no other core alterations in progress | 3.10.8.4 | 3.10.8.4 |
| Verify CRD charging water header pressure | 3.10.8.6 | 3.10.8.6 |
| **Recirculation Loops - Testing** | **3.10.9** | **--------** |
| Verify LCO 3.4.1 requirements suspended for < 24 hours | 3.10.9.1 | ---------- |
| Verify Thermal power < 5% RTP during Physics Test | 3.10.9.2 | ---------- |
| **Training Startups** | **3.10.10** | **3.10.9** |
| Verify all operable IRM channels are <25/40 div. of full scale [CPS – Verify Thermal Power] | 3.10.10.1 | 3.10.9.1 |
| Verify average reactor coolant temperature < 200 F | 3.10.10.2 | 3.10.9.2 |
| **Single Control Rod Withdrawal - Refueling** | **------** | **3.10.10** |
| Verify all other control rods inserted | --------- | 3.10.10.1 |
| Verify no other Core Alterations in progress | --------- | 3.10.10.2 |
| **Programs (Surveillance Frequency Control Program)** | **5.5.15** | **5.5.16** |

TSTF-425 (NUREG-1434) vs. CPS Cross-Reference Footnotes:

(1) The Technical Specification (TS) Section Title/Surveillance Description portion of this attachment is a summary description of the referenced TSTF-425 (NUREG-1434)/CPS TS Surveillances which is provided for information purposes only and is not intended to be a verbatim description of the TS Surveillances.

(2) This CPS Surveillance Frequency is provided in the CPS Inservice Testing (IST) Program. This CPS Surveillance Frequency is not proposed for inclusion in the Surveillance Frequency Control Program.

(3) This CPS Surveillance Frequency is provided in the CPS Primary Containment Leakage Rate Testing Program. This CPS Frequency is not proposed for inclusion in the Surveillance Frequency Control Program.

(4) This CPS Surveillance Frequency is "Following activities that could result in nozzle blockage." This CPS Frequency is not proposed for inclusion in the Surveillance Frequency Control Program.

(5) This CPS Surveillance Frequency is "Once prior to each Type A test required by SR 3.6.1.1.1." This CPS Frequency is not proposed for inclusion in the Surveillance Frequency Control Program.

(6) This CPS Surveillance Frequency is "As specified in Table 3.8.1-1." Table 3.8.1-1 specifies Frequencies based on the number of failures in the last 25 valid tests. The CPS Frequencies specified in Table 3.8.1-1 are proposed to be controlled by the Surveillance Frequency Control Program and Table 3.8.1-1 is deleted.

**Description of Amendment Request:** This amendment request involves the adoption of approved changes to the Standard Technical Specifications (STS) for General Electric Plants, BWR/6 (NUREG-1434), to allow relocation of specific TS surveillance frequencies to a licensee-controlled program. The proposed changes are described in Technical Specification Task Force (TSTF) Traveler, TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b," (ADAMS Accession No. ML090850642), and are described in the Notice of Availability published in the Federal Register on July 6, 2009 (74 FR 31996).

The proposed changes are consistent with NRC-approved Industry/ TSTF Traveler, TSTF-425, Revision 3. The proposed changes relocate surveillance frequencies to a licensee-controlled program, the Surveillance Frequency Control Program. The changes are applicable to licensees using probabilistic risk guidelines contained in NRC-approved Nuclear Energy Institute (NEI) 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," April 2007 (ADAMS Accession No. 071360456).

**Basis for proposed no significant hazards consideration:** As required by 10 CFR 50.91(a), the Exelon Generation Company, LLC (EGC) analysis of the issue of no significant hazards consideration is presented below:

1. Do the proposed changes involve a significant increase in the probability or consequences of any accident previously evaluated?

   Response: No.

   The proposed changes relocate the specified frequencies for periodic surveillance requirements to licensee control under a new Surveillance Frequency Control Program. Surveillance frequencies are not an initiator to any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The systems and components required by the technical specifications for which the surveillance frequencies are relocated are still required to be operable, meet the acceptance criteria for the surveillance requirements, and be capable of performing any mitigation function assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly increased.

   Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any previously evaluated?

   Response: No.

   No new or different accidents result from utilizing the proposed changes. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any new or different requirements. The changes do not alter

assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions and current plant operating practice.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in the margin of safety?

Response: No.

The design, operation, testing methods, and acceptance criteria for systems, structures, and components (SSCs), specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plant licensing basis (including the final safety analysis report and bases to the Technical Specifications (TS)), because these are not affected by changes to the surveillance frequencies. Similarly, there is no impact to safety analysis acceptance criteria as described in the plant licensing basis. To evaluate a change in the relocated surveillance frequency, EGC will perform a probabilistic risk evaluation using the guidance contained in NRC approved NEI 04-10, Revision 1 in accordance with the TS Surveillance Frequency Control Program. NEI 04-10, Revision 1, methodology provides reasonable acceptance guidelines and methods for evaluating the risk increase of proposed changes to surveillance frequencies consistent with Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998 (ADAMS Accession No. ML003740176).

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, EGC concludes that the requested changes do not involve a significant hazards consideration as set forth in 10 CFR 50.92, "Issuance of amendment," paragraph (c).