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

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

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

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 Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, respectively. The proposed amendment would modify the Braidwood Station 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 Braidwood Station, Unit 1 and Unit 2, TS pages marked up to show the proposed changes.

- Attachment 4 provides the proposed Braidwood Station, Unit 1 and Unit 2, 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 Braidwood Station TS cross-reference.

- Attachment 6 provides the proposed No Significant Hazards Consideration.

The proposed change has been reviewed by the Braidwood Station 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. Kenneth M. Nicely at (630) 657-2803.

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

Respectfully,

Patrick R. Simpson
Manager – Licensing

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 Specifications Bases Pages
5. TSTF-425 vs. Braidwood Station Cross-Reference
6. Proposed No Significant Hazards Consideration

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

ATTACHMENT 1
Description and Assessment

1.0 DESCRIPTION

The proposed amendment would modify the Braidwood Station, Units 1 and 2, 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, 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 safety evaluation dated July 6, 2009. This review included a review of the NRC's evaluation, TSTF-425, Revision 3, and the requirements specified in NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," (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 1.200, 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 Regulatory Guide 1.200.

EGC has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC are applicable to Braidwood Station, Units 1 and 2, and justify this amendment to incorporate the changes to the Braidwood Station 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 Braidwood Station 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 Braidwood Station, Units 1 and 2. Additionally, mark-ups of the proposed changes to TS Bases pages are provided in Attachment 4 for Braidwood Station, Units 1 and 2. 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.

2. The definition of STAGGERED TEST BASIS is being retained in Braidwood Station TS Definition Section 1.1 because this terminology is mentioned in Administrative TS Section 5.5.18, "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 Braidwood Station basis for frequencies that 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-1431 Surveillance Requirements (SRs) included in TSTF-425 versus the Braidwood Station SRs included in this amendment request. Attachment 5 includes a summary description of the referenced TSTF-425 (NUREG-1431)/Braidwood Station 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-1431 SRs included in TSTF-425 and corresponding Braidwood Station SRs with identical SR numbers;

    b. NUREG-1431 SRs included in TSTF-425 and corresponding Braidwood Station SRs with differing SR numbers;

    c. NUREG-1431 SRs included in TSTF-425 that are not contained in the Braidwood Station TS; and

    d. Braidwood Station plant-specific SRs that are not contained in NUREG-1431; and therefore, are not included in the TSTF-425 mark-ups.

    Concerning the above, Braidwood Station SRs that have SR numbers identical to the corresponding NUREG-1431 SRs are not deviations from TSTF-425.

Braidwood Station SRs with SR numbers that differ from the corresponding NUREG-1431 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-1431 SRs that are not contained in the Braidwood Station TS, the corresponding NUREG-1431 mark-ups included in TSTF-425 for these SRs are not applicable to Braidwood Station. 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 Braidwood Station plant-specific SRs that are not contained in NUREG-1431, and therefore, are not included in the NUREG-1431 mark-ups provided in TSTF-425, EGC has determined that the relocation of the Frequencies for these Braidwood Station 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 systems, structures, and components (SSCs) for which Frequencies are changed to assure that reduced testing does not adversely impact the SSCs. In addition, the NEI 04-10, Revision 1 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 Braidwood Station, Units 1 and 2, and is provided as Attachment 6 to this amendment request, which satisfies the requirements of 10 CFR 50.91(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 Braidwood Station, Units 1 and 2.

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 Braidwood Station, Units 1 and 2, and the determination is 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

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

5. Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998

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2.1 Overview

The implementation of the Surveillance Frequency Control Program (also referred to as Technical Specification Initiative 5b) at Braidwood will follow the guidance provided in NEI 04-10, Revision 1 (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 NEI 04-10 (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 1.200, Revision 1, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," (Reference 2). 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
   - 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 Regulatory Guide (currently, RG-1.200 Revision 1 includes only 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 attachment is to address the requirements identified in item 4 above.

2.2 Technical Adequacy of the PRA Model

The 6E1 version of the Byron/Braidwood PRA model[1] (Reference 3) is the most recent evaluation of the risk profile at Braidwood for internal event challenges. The Braidwood 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 Braidwood 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 Braidwood PRA.

<u>PRA Maintenance and Update</u>

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 (Reference 4), "Risk Management") and subordinate implementation procedures. EGC procedure ER-AA-600-1015 (Reference 5), "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, and

- Plant specific initiating event frequencies, failure rates, and maintenance unavailabilities are updated approximately every four years.

[1] Byron and Braidwood use a combined model, with appropriate flags to differentiate between sites/units. Therefore, the Peer review findings for Braidwood are also applicable to Byron, and vice-versa.

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, and
- 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 (10 CFR 50.65(a)(4)) (Reference 6).

In accordance with this guidance, regularly scheduled PRA model updates nominally occur on an approximately 4-year cycle; longer intervals may be justified if it can be shown that the PRA continues to adequately represent the as-built, as-operated plant. EGC completed the 6E1 update to the Braidwood PRA model in 2009, which was the result of incorporation of a plant modification into the previous PRA model of record, Revision 6D.

As indicated previously, RG-1.200 Revision 1 also requires that additional information be provided as part of the 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.

2.2.1 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 Braidwood 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.

2.2.2 Applicability of Peer Review Findings and Observations

Several assessments of technical capability have been made, and continue to be planned, for the Byron/Braidwood, Units 1 and 2, PRA models. These assessments are as follows and further discussed in the paragraphs below.

- Scientech conducted an independent self-assessment of the Byron/Braidwood PRA model in 1999, prior to the Braidwood PRA peer review. All significant comments from this review have been addressed.

- An independent PRA peer review of the Braidwood PRA model (Reference 7) was conducted under the auspices of the PWR Owners Group in 1999, following the Industry PRA Peer Review process (Reference 8). This peer review included an assessment of the PRA model maintenance and update process.

- During 2005 and 2006 the Braidwood, Units 1 and 2, PRA model results were evaluated in the PWR Owners Group PRA cross-comparisons study performed in support of implementation of the mitigating systems performance indicator (MSPI) process (Reference 9). Braidwood did not have any identified outliers as a result of this review.

- Following the Byron/Braidwood PRA model update in 2007-2008, a self-assessment (Reference 10) of the Byron/Braidwood PRA model against the ASME PRA Standard was performed using Regulatory Guide 1.200, Revision 1.

A summary of the disposition of 1999 and 2000 Industry PRA Peer Review facts and observations (F&Os) for the Byron and Braidwood, Units 1 and 2 PRA models was documented as part of the statement of PRA capability for MSPI in the Braidwood MSPI Basis Document (Reference 11). As noted in that document, all significance level A & B F&Os were addressed with the completion of the approved PRA model. Also noted in that document was the fact that, after allowing for plant-specific features, there are no MSPI cross-comparison outliers for Braidwood (refer to the third bulleted item above).

2.2.3 Consistency with Applicable PRA Standards

As indicated above, following the Byron/Braidwood PRA model update in 2007-2008, a self-assessment of the Byron/Braidwood PRA model against the ASME PRA Standard Addendum B was performed using Regulatory Guide 1.200, Revision 1. The identified gaps from this self-assessment are summarized in Table 2-1 along with an assessment of the impact for this application.

These gaps will be reviewed for consideration for the next periodic 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 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.

2.2.4 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 2.2.1 and 2.2.3 above for each STI change assessment will be documented and included in the results of the risk analysis that goes to the IDP.

Table 2-1
Status of Identified Gaps to Capability Category II of the ASME PRA Standard

Title	Description of Gap	Applicable Supporting Requirements	Current Status / Comment	Importance to Application
Gap #1	DOCUMENT the significant contributors (such as initiating events, accident sequences, basic events) to CDF in the PRA results summary. PROVIDE a detailed description of significant accident sequences or functional failure groups.	QU-F3	Open.	This is a documentation issue not affecting the technical adequacy of the PRA model. The PRA models capture all significant contributors.
Gap #2	Include an assessment of the significance of assumptions on the quantitative results.	QU-F4	Open – Identification of key assumptions is application specific. An assessment of important PRA modeling assumptions has been performed for the base internal events at power model based on application of the approach specified in NUREG-1855 (Reference 12) and EPRI TR-1016737 (Reference 13)	This would be addressed by sensitivities per NEI 04-10 if applicable to the specific STI evaluation.
Gap #3	DOCUMENT the quantitative definition used for significant basic event, significant cutset, and significant accident sequence.	QU-F6	Open.	This is a documentation issue. The PRA models, on which the LAR assessment is based, capture all significant contributors.
Gap #4	The LERF analysis is based on the NUREG/CR-6595 methodology (Reference 14). As such, it represents a generally conservative, simplified approach. The noted Supporting Requirements meet the Capability Category I criteria.	LE-B1 LE-B2 LE-C1 LE-C2a LE-C2b LE-C3 LE-C4 LE-C8a LE-C9a	Open.	Given the conservative nature of the NUREG/CR-6595 (Reference 14) approach used, the LERF results are believed to also be conservative relative to this application. This would be addressed by sensitivities per NEI 04-10 if applicable to the specific STI evaluation.

Table 2-1
Status of Identified Gaps to Capability Category II of the ASME PRA Standard

Title	Description of Gap	Applicable Supporting Requirements	Current Status / Comment	Importance to Application
		LE-C10 LE-D1a LE-D1b LE-D2 LE-D4 LE-D5 LE-E2 LE-E3 LE-F1a LE-G3		
Gap #5	… characterize LERF uncertainties consistent with the applicable requirements of Tables 4.5.8-2(d) and 4.5.8-2(e)	LE-F3	Open – A formal evaluation of uncertainties in the LERF model has not been performed. However, since the NUREG/CR-6595 (Reference 14) consensus modeling approach has been used, the results are understood to be conservative.	This would be addressed by sensitivities per NEI 04-10 if applicable to the specific STI evaluation.
Gap #6	Addendum B of the ASME PRA Standard (Reference 15) added Supporting Requirements to document the quantitative definition used for significant basic event, significant cutset, significant accident sequence, and significant accident progression sequence in the CDF and LERF analysis.	QU-F6 LE-G6	Open.	This is a documentation issue not affecting the technical adequacy of the PRA model. Changes to the model are not required to address this item.
Gap #7	Several Supporting Requirements associated with treatment of model uncertainty and related model assumptions have been recently redefined. NRC has issued a clarification (Reference 16) to its endorsement of the PRA Standard. NRC and EPRI have prepared	QU-E1 QU-E2 QU-E3 QU-E4 QU-F4 IE-C13	Open – Identification of key assumptions is application specific. An assessment of important PRA modeling assumptions has been performed for the base internal	This would be addressed by sensitivities per NEI 04-10 if applicable to the specific STI evaluation.

Table 2-1
Status of Identified Gaps to Capability Category II of the ASME PRA Standard

Title	Description of Gap	Applicable Supporting Requirements	Current Status / Comment	Importance to Application
	guidance on an approach to meet these new requirements.	IE-D3 AS-C3 SC-C3 SY-C3 HR-G9 HR-I3 DA-D3 DA-E2 DA-E3 IF-F3 LE-E4 LE-F2 LE-F3 LE-G4	events at power model based on application of the approach specified in NUREG-1855 (Reference 12) and EPRI TR-1016737 (Reference 13).	
Gap #8	Model documentation needs to be revised to reflect the current model (6E1).	AS-C2 DA-C6 DA-C10 DA-D4 IE-C10 IF-C2 IF-C2c IF-D7 IF-E3a IF-F1 IF-F2 QU-F6 SC-A1 SC-B5 SC-C2 SY-A4 SY-C1 SY-C2	Open.	This is a documentation issue not affecting the technical adequacy of the PRA model.

Table 2-1
Status of Identified Gaps to Capability Category II of the ASME PRA Standard

Title	Description of Gap	Applicable Supporting Requirements	Current Status / Comment	Importance to Application
Gap #9	Plant Specific MOV (or AOV) failure data was not collected for further analysis.	DA-C3	Open.	This would be addressed by sensitivities per NEI 04-10 if applicable to the specific STI evaluation. Speifically the required failure rate sensitivity.

2.3 External Events Considerations

External hazards were evaluated in the Braidwood Individual Plant Examination for 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 Braidwood IPEEE study are documented in the Braidwood IPEEE Main Report (Reference 17). Each of the Braidwood external event evaluations were reviewed as part of the Submittal by the NRC and compared to the requirements of NUREG-1407 (Reference 18). The NRC transmitted to EGC (formerly Commonwealth Edison Company) in 2001 their Staff Evaluation Report of the Braidwood IPEEE Submittal (Reference 19).

Consistent with Generic Letter 88-20, the Braidwood IPEEE Submittal does not screen out seismic or fire hazards, but provides quantitative analyses. The seismic risk analysis provided in the Braidwood IEEE was based on the seismic margin assessment (Reference 20). No significant seismic concerns were identified and it was concluded that the plants possess significant seismic margin. The internal fire events were addressed by using the Fire Induced Vulnerability Evaluation (FIVE) methodology (Reference 21). As such, there are no comprehensive CDF and LERF values available from the IPEEE to support the STI risk assessment.

In addition to internal fires and seismic events, the Braidwood IPEEE analysis of high winds or tornados, external floods, transportation accidents, aircraft impacts, nearby facility accidents, turbine missiles, and other external hazards was accomplished by reviewing the plant environs against regulatory requirements regarding these hazards.

<u>Fire PRA</u>

Since the performance of the IPEEE, a fire PRA model for the Braidwood plants was developed and has been undergoing a continuous development process with incremental refinements of the model. The current fire PRA results (Reference 22) based on NUREG/CR-6850 (Reference 23) and EPRI-1016735 (Reference 24) are still considered quite conservative. Areas of uncertainty associated with this model are primarily related to areas of conservatism associated with the inputs to the model:

1. Ignition frequency data
2. Heat release rate data
3. Fire development timeline.

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 cannot 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 appropriate, but refinements may need to be made 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).

2.4 Summary

The Braidwood 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.

2.5 References

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2. Regulatory Guide 1.200, *An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk Informed Activities*, Revision 1, January 2007.
3. BB PRA-014, Rev. 6E1, *Byron/Braidwood PRA Quantification Notebook*, July 2009.
4. Exelon T&RM, ER-AA-600, *Risk Management*, Rev. 5.
5. Exelon T&RM, ER-AA-600-1015, *FPIE PRA Model Update*, Revision 10.
6. 10 CFR 50.65, *Maintenance Rule*, USNRC.
7. M. Barrett, et al, *Braidwood Nuclear Generating Station Probabilistic Risk Assessment Peer Review Report*, Final Report, September 1999.
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9. Westinghouse Owners' Group, *Mitigating Systems Performance Index Cross Comparison (PA-RMSC-0209)*, WCAP-16464-NP, Revision 0, August 2005.
10. BB PRA-024, Rev 0, *Self Assessment*, September 2008.
11. BW-MSPI-001, *Braidwood MSPI Basis Document*, Rev. 3, June 2009.
12. NUREG-1855, *Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making*, USNRC, March 2009.
13. *Treatment of Parameter and Model Uncertainty for Probabilistic Risk Assessments*, EPRI, Palo Alto, CA: December 2008. TR-1016737.
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15. American Society of Mechanical Engineers, *Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications*, (ASME RA-S-2002), Addenda RA-Sa-2003, Addenda RA-Sb-2005, and Addenda RA-Sc-2007, August 2007.
16. U.S. Nuclear Regulatory Commission Memorandum to Michael T. Lesar from Farouk Eltawila, *"Notice of Clarification to Revision 1 of Regulatory Guide 1.200,"* July 27, 2007.
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19. Letter from Mahesh Chawla to Oliver D Kingsley, *Review of Individual Plant Examination of External Events – Braidwood Station, Units 1 and 2 (TAC NOS. M83593 and M83594),* May 30, 2001.
20. EPRI NP-6041, NTS Engineering, et al., *A Method for Assessment of Nuclear Power Plant Seismic Margin*, Electric Power Research Institute, October 1988.
21. Professional Loss Control, Inc., *Fire-Induced Vulnerability Evaluation (FIVE) Methodology Plant Screening Guide*, Electric Power Research Institute, April 1992. TR-100370.
22. BB-PSA-21.06, *Byron/Braidwood Fire PRA – Summary Report*, Revision 2, September 2009.
23. NUREG/CR-6850 (EPRI TR-1011989), *Fire PRA Methodology for Nuclear Power Facilities*, EPRI/NRC-RES, September 2005.
24. *EPRI Fire PRA Methods Enhancements, Additions, Clarifications, and Refinements to EPRI TR-1019189,* December 2008. TR-1016735.

ATTACHMENT 3
Markup of Proposed Technical Specifications Pages

Braidwood Station, Units 1 and 2

Facility Operating License Nos. NPF-72 and NPF-77

<u>REVISED TECHNICAL SPECIFICATIONS PAGES</u>

3.1.1-1	3.3.4-2	3.4.15-3	3.7.7-2	3.8.7-2
3.1.2-2	3.3.5-2	3.4.16-2	3.7.8-3	3.8.8-2
3.1.4-4	3.3.6-3	3.4.16-3	3.7.9-1	3.8.9-3
3.1.5-2	3.3.7-2	3.4.17-2	3.7.10-3	3.8.10-4
3.1.6-2	3.3.8-3	3.5.1-2	3.7.10-4	3.9.1-1
3.1.6-3	3.3.9-3	3.5.2-3	3.7.11-3	3.9.2-2
3.1.8-2	3.4.1-2	3.5.2-4	3.7.12-2	3.9.3-2
3.2.1-3	3.4.2-1	3.5.4-2	3.7.13-3	3.9.4-2
3.2.1-5	3.4.3-2	3.5.5-2	3.7.13-4	3.9.5-2
3.2.1-6	3.4.4-1	3.6.2-5	3.7.14-1	3.9.6-2
3.2.2-3	3.4.5-3	3.6.3-5	3.7.15-1	3.9.7-1
3.2.3-1	3.4.5-4	3.6.3-6	3.8.1-5	5.5-23
3.2.4-4	3.4.6-2	3.6.4-1	3.8.1-6	
3.2.5-1	3.4.6-3	3.6.5-1	3.8.1-7	
3.3.1-8	3.4.7-3	3.6.6-2	3.8.1-8	
3.3.1-9	3.4.8-2	3.6.6-3	3.8.1-9	
3.3.1-10	3.4.9-2	3.6.7-1	3.8.1-10	
3.3.1-11	3.4.11-3	3.6.7-2	3.8.1-11	
3.3.1-12	3.4.12-4	3.7.2-2	3.8.1-12	
3.3.2-6	3.4.12-5	3.7.3-1	3.8.3-2	
3.3.2-7	3.4.13-2	3.7.4-2	3.8.4-3	
3.3.2-8	3.4.14-3	3.7.5-2	3.8.6-3	
3.3.3-3	3.4.14-4	3.7.6-2	3.8.6-4	

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

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

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify SDM is within the limits specified in the COLR.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify measured core reactivity is within ± 1% Δk/k of predicted values.	Prior to entering MODE 1 after each refueling
SR 3.1.2.2	-------------------NOTES------------------ 1. Only required to be performed after 60 Effective Full Power Days (EFPD). 2. The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 EFPD after each fuel loading. --- Verify measured core reactivity is within ± 1% Δk/k of predicted values.	~~31 EFPD~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	~~12 hours~~
SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.	~~92 days~~
SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. T_{avg} ≥ 550°F; and b. All reactor coolant pumps operating.	Prior to criticality after each removal of the reactor head

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.5.1 Verify each shutdown bank is within the insertion limits specified in the COLR.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Control bank sequence or overlap limits not met.	B.1.1 Verify SDM is within the limits specified in the COLR. OR B.1.2 Initiate boration to restore SDM to within limit. AND B.2 Restore control bank sequence and overlap to within limits.	1 hour 1 hour 2 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2 with $k_{eff} < 1.0$.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to criticality
SR 3.1.6.2	Verify each control bank is within the insertion limits specified in the COLR.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.6.3	Verify each control bank not fully withdrawn from the core is within the sequence and overlap limits specified in the COLR.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.8.1 Perform CHANNEL OPERATIONAL TEST on power range and intermediate range channels per SR 3.3.1.7, SR 3.3.1.8, and Table 3.3.1.1-1.	Prior to initiation of PHYSICS TESTS
SR 3.1.8.2 Verify the RCS lowest loop average temperature is ≥ 530°F.	~~30 minutes~~
SR 3.1.8.3 Verify THERMAL POWER is ≤ 5% RTP.	~~1 hour~~
SR 3.1.8.4 Verify SDM is within the limits specified in the COLR.	~~24 hours~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	-------------------NOTES------------------ 1. During power escalation at the beginning of each cycle, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained. 2. Not required to be performed until 12 hours after declaring Power Distribution Monitoring System (PDMS) inoperable. Performance of SR 3.2.1.3 satisfies the initial performance of this SR after declaring PDMS inoperable. --	
	Verify $F^C_Q(Z)$ is within limit specified in the COLR.	Prior to exceeding 75% RTP after each refueling <u>AND</u> Once within 12 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F^C_Q(Z)$ was last verified <u>AND</u> ~~31 Effective Full Power Days (EFPD) thereafter~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued) -------------------NOTES------------------- 3. Not required to be performed until 12 hours after declaring PDMS inoperable. Performance of SR 3.2.1.4 satisfies the initial performance of this SR after declaring PDMS inoperable. --- Verify $F_Q^W(Z)$ is within limit specified in the COLR.	Prior to exceeding 75% RTP after each refueling AND Once within 12 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND ~~31 EFPD thereafter~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.1.3	--------------------NOTE-------------------- Only required to be performed when PDMS is OPERABLE. --- Verify $F_Q^C(Z)$ is within limit specified in the COLR.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.1.4	--------------------NOTE-------------------- Only required to be performed when PDMS is OPERABLE. --- Verify $F_Q^W(Z)$ is within limit specified in the COLR.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	-------------------NOTE-------------------- Not required to be performed until 12 hours after declaring PDMS inoperable. Performance of SR 3.2.2.2 satisfies the initial performance of this SR after declaring PDMS inoperable. --	
	Verify $F^N_{\Delta H}$ is within limits specified in the COLR.	Prior to exceeding 75% RTP after each refueling AND ~~31 Effective Full Power Days thereafter~~
SR 3.2.2.2	-------------------NOTE-------------------- Only required to be performed when PDMS is OPERABLE. --	
	Verify $F^N_{\Delta H}$ is within limit specified in the COLR.	~~7 days~~

In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD)

LCO 3.2.3 The AFD shall be maintained within the limits specified in the COLR.

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

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP when Power Distribution Monitoring System (PDMS) is inoperable.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.3.1 -------------------NOTE------------------- Not required to be performed until 12 hours after declaring PDMS inoperable. -- Verify AFD is within limits for each OPERABLE excore channel.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	-------------------NOTES-------------------- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channel inputs can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. 3. Not required to be performed until 12 hours after declaring PDMS inoperable. --- Verify QPTR is ≤ 1.02 by calculation.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.4.2	-------------------NOTES------------------- 1. Not required to be performed until 12 hours after input from one Power Range Neutron Flux channel is inoperable with THERMAL POWER > 75% RTP. 2. Not required to be performed until 12 hours after declaring PDMS inoperable. --- Verify QPTR is ≤ 1.02 using the movable incore detectors.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.5 Departure from Nucleate Boiling Ratio (DNBR)

LCO 3.2.5 DNBR shall be within the limit specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP when Power Distribution Monitoring System (PDMS) is OPERABLE.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DNBR not within limit.	A.1 Restore DNBR to within limit.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 50% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.5.1 Verify DNBR is within limit specified in the COLR.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.1.2	-------------------NOTES------------------ 1. Adjust NIS channel if absolute difference is > 2%. 2. Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. -- Compare results of calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output.	~~24 hours~~
SR 3.3.1.3	-------------------NOTES------------------ 1. Adjust NIS channel if absolute difference is ≥ 3%. 2. Only required to be performed with THERMAL POWER > 15% RTP. -- Compare results of the incore measurements to NIS AFD.	Prior to exceeding 75% RTP after each refueling <u>AND</u> ~~31 Effective Full Power Days (EFPD) thereafter~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.4	-------------------NOTE------------------- This Surveillance must be performed on the RTBB prior to placing the bypass breaker in service. -- Perform TADOT.	~~62 days on a STAGGERED TEST BASIS~~
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.1.6	-------------------NOTE------------------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 75% RTP. -- Calibrate excore channels to agree with incore measurements.	~~92 EFPD~~
SR 3.3.1.7	-------------------NOTE------------------- Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -- Perform COT.	~~184 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	-------------------NOTE-------------------- Verification of setpoint is not required. --- Perform TADOT.	~~92 days~~
SR 3.3.1.10	-------------------NOTE-------------------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. --- Perform CHANNEL CALIBRATION.	~~18 months~~
SR 3.3.1.11	-------------------NOTE-------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	~~18 months~~
SR 3.3.1.12	Perform COT.	~~18 months~~
SR 3.3.1.13	-------------------NOTE-------------------- Verification of setpoint is not required. --- Perform TADOT.	~~18 months~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.14	-------------------NOTE------------------- Verification of setpoint is not required. -- Perform TADOT.	-----NOTE------ Only required when not performed within previous 31 days --------------- Prior to reactor startup
SR 3.3.1.15	-------------------NOTE------------------- Neutron detectors are excluded from response time testing. -- Verify RTS RESPONSE TIME is within limits.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. One or more channels inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	<u>OR</u>	
	L.2.1 Be in MODE 3.	7 hours
	<u>AND</u>	
	L.2.2 Be in MODE 4.	13 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.2.2	Perform COT.	~~31 days~~
SR 3.3.2.3	------------------NOTE------------------ Verification of relay setpoints not required. --- Perform TADOT.	~~31 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.4	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.2.5	Perform MASTER RELAY TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.2.6	Perform COT.	~~184 days~~
SR 3.3.2.7	-------------------NOTE-------------------- Verification of relay setpoints not required. --- Perform TADOT.	~~92 days~~
SR 3.3.2.8	Perform SLAVE RELAY TEST.	~~18 months~~
SR 3.3.2.9	-------------------NOTE-------------------- Verification of setpoint not required. --- Perform TADOT.	~~18 months~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.10	-------------------NOTE------------------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. -- Perform CHANNEL CALIBRATION.	~~18 months~~
SR 3.3.2.11	Verify ESFAS RESPONSE TIMES are within limit.	~~18 months~~
SR 3.3.2.12	Verify ESFAS RESPONSE TIMES are within limit.	~~18 months on a STAGGERED TEST BASIS~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. ---------NOTE--------- Only applicable to Functions 11, 12, and 14. ---------------------- Required Action and associated Completion Time of Condition D or E not met.	G.1 Initiate action in accordance with Specification 5.6.7.	Immediately

SURVEILLANCE REQUIREMENTS

-------------------------------------NOTE-------------------------------------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2	-------------------NOTE-------------------- Radiation detectors for Function 11, Containment Area Radiation, are excluded. --- Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2	--------------------NOTE-------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~18 months~~ 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	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	--------------------NOTE-------------------- Verification of relay setpoints not required. -- Perform TADOT.	~~31 days~~
SR 3.3.5.2	Perform CHANNEL CALIBRATION with setpoint Allowable Value as follows: a. Loss of voltage Allowable Value ≥ 2730 V with a time delay of ≤ 1.9 seconds. b. Degraded voltage Allowable Value ≥ 3930 V with a time delay of 310 ± 30 seconds.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.6.2	--------------NOTE-------------- This Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. ------------------------------- Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.6.3	--------------NOTE-------------- This Surveillance is only applicable to the master relays of the ESFAS Instrumentation. ------------------------------- Perform MASTER RELAY TEST.	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.6.4	Perform COT.	~~92 days~~
SR 3.3.6.5	Perform SLAVE RELAY TEST.	~~18 months~~
SR 3.3.6.6	Perform CHANNEL CALIBRATION.	~~18 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 or B not met during movement of irradiated fuel assemblies.	D.1	Suspend movement of irradiated fuel assemblies.	Immediately
E. Required Action and associated Completion Time of Condition A or B not met in MODE 5 or 6.	E.1	Initiate action to restore one VC Filtration System train to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.7.2	Perform COT.	~~92 days~~
SR 3.3.7.3	Perform CHANNEL CALIBRATION.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
Refer to Table 3.3.8-1 to determine which SRs apply for each FHB Ventilation System Actuation Function.

SURVEILLANCE	FREQUENCY
SR 3.3.8.1 Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.8.2 Perform COT.	~~92 days~~
SR 3.3.8.3 Perform CHANNEL CALIBRATION.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Verify one or more reactor coolant pump(s) in operation.	~~12 hours~~
SR 3.3.9.2	Verify each RCS loop isolation valve is open.	~~12 hours~~
SR 3.3.9.3	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.9.4	Verify each Boron Dilution Alert channel selector switch is in the Normal position.	~~12 hours~~
SR 3.3.9.5	Verify each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.3.9.6	Perform COT.	~~92 days~~
SR 3.3.9.7	-------------------NOTE-------------------- The CHANNEL CALIBRATION is only required to include that portion of the channel associated with the Boron Dilution Alert function. --- Perform CHANNEL CALIBRATION.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is within the limit specified in the COLR.	~~12 hours~~
SR 3.4.1.2	Verify RCS average temperature (T_{avg}) is within the limit specified in the COLR.	~~12 hours~~
SR 3.4.1.3	Verify RCS total flow rate is ≥ 380,900 gpm and within the limit specified in the COLR.	~~12 hours~~
SR 3.4.1.4	-------------------NOTE-------------------- Not required to be performed until 7 days after ≥ 90% RTP. --- Verify by precision heat balance that RCS total flow rate is ≥ 380,900 gpm and within the limit specified in the COLR.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each RCS loop average temperature (T_{avg}) shall be ≥ 550°F.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.2.1 Verify RCS T_{avg} in each loop ≥ 550°F.	~~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 whenever this Condition is entered. ---------------------- Requirements of LCO not met any time other than in MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limits. AND C.2 Determine RCS is acceptable for continued operation.	Immediately Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops-MODES 1 and 2

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

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.4.1 Verify each RCS loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition D not met.	E.1 Be in MODE 4.	12 hours
F. Two required RCS loops inoperable.	F.1 Initiate action to place the Rod Control System in a condition incapable of rod withdrawal.	Immediately
	AND	
	F.2 Suspend all operations involving a reduction of RCS boron concentration.	Immediately
	AND	
	F.3 Initiate action to restore one RCS loop to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.5.1 Verify each required RCS loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	Verify steam generator secondary side narrow range water level is ≥ 18% for each required RCS loop.	~~12 hours~~
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to each required pump that is not in operation.	~~7 days~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required loop inoperable.	B.1 Initiate action to restore a second loop to OPERABLE status. AND B.2 --------NOTE--------- Only required if RHR loop is OPERABLE. --------------------- Be in MODE 5.	Immediately 24 hours
C. Two required loops inoperable.	C.1 Suspend all operations involving a reduction of RCS boron concentration. AND C.2 Initiate action to restore one loop to OPERABLE status.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.6.1 Verify required RHR or RCS loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.6.2 Verify SG secondary side narrow range water level is ≥ 18% for each required RCS loop.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.6.3	Verify correct breaker alignment and indicated power are available to each required pump that is not in operation.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two required RHR loops inoperable. OR Required RHR loop inoperable and one or both required SG secondary side water level(s) not within limits.	D.1 Suspend all operations involving a reduction of RCS boron concentration.	Immediately
	AND	
	D.2.1 Initiate action to restore one RHR loop to OPERABLE status.	Immediately
	OR	
	D.2.2 Initiate action to restore required SG secondary side water level(s) to within limits.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.7.1	Verify required RHR loop is in operation.	~~12 hours~~
SR 3.4.7.2	Verify SG secondary side narrow range water level is ≥ 18% in required SGs.	~~12 hours~~
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to each required RHR pump that is not in operation.	~~7 days~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One required RHR loop inoperable.	B.1 Initiate action to restore RHR loop to OPERABLE status.	Immediately
C. Two required RHR loops inoperable.	C.1 Suspend all operations involving reduction in RCS boron concentration.	Immediately
	AND	
	C.2 Initiate action to restore one RHR loop to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

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

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.9.1 Verify pressurizer water level is ≤ 92%.	~~12 hours~~
SR 3.4.9.2 Verify capacity of each required group of pressurizer heaters is ≥ 150 kW.	~~18 months~~
SR 3.4.9.3 Verify required pressurizer heaters are capable of being powered from an ESF power supply.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	-------------------NOTE-------------------- Not required to be met with block valve closed in accordance with the Required Action of Condition B or E. -- Perform a complete cycle of each block valve.	~~92 days~~
SR 3.4.11.2	-------------------NOTE-------------------- Only required to be performed in MODES 1 and 2. -- Perform a complete cycle of each PORV.	~~18 months~~
SR 3.4.11.3	Perform a complete cycle of each solenoid air control valve and check valve on the air accumulators in PORV control systems.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify no SI pump is capable of injecting into the RCS.	~~12 hours~~
SR 3.4.12.2	Verify a maximum of one charging pump (centrifugal) is capable of injecting into the RCS.	~~12 hours~~
SR 3.4.12.3	--------------------NOTE-------------------- Only required to be met for accumulator whose pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR. -- Verify each accumulator is isolated.	 ~~12 hours~~
SR 3.4.12.4	Verify required RCS vent ≥ 2.0 square inches open.	~~12 hours for unlocked open vent valve(s)~~ ~~AND~~ ~~31 days for locked open vent valve(s)~~
SR 3.4.12.5	Verify RHR suction valves are open for each required RHR suction relief valve.	~~72 hours~~
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	~~72 hours~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.7	-------------------NOTE------------------- Not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ 350°F. -- Perform a COT on each required PORV, excluding actuation.	~~31 days~~
SR 3.4.12.8	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	-------------------NOTES------------------- 1. Only required to be performed in MODES 1 and 2. 2. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. 3. Not required to be performed for RH8701A and B and RH8702A and B on the Frequency required following valve actuation or flow through the valve. ---	
	Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2215 psig and ≤ 2255 psig.	In accordance with the Inservice Testing Program, and ~~18 months~~ In accordance with the Surveillance Frequency Control Program AND Prior to entering MODE 2 whenever the unit has been in MODE 5 for ≥ 7 days, if leakage testing has not been performed once within the previous 9 months AND (continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.14.1 (continued)	Within 24 hours following valve actuation due to automatic or manual action or flow through the valve
SR 3.4.14.2 Verify RHR System suction isolation valve interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 360 psig.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the containment atmosphere particulate radioactivity monitor.	~~12 hours~~
SR 3.4.15.2	Perform COT of the containment atmosphere particulate radioactivity monitor.	~~92 days~~
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump monitor.	~~18 months~~
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the containment atmosphere particulate radioactivity monitor.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> DOSE EQUIVALENT I-131 specific activity in the unacceptable region of Figure 3.4.16-1.	B.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours
C. Gross specific activity not within limit.	C.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.16.1 Verify reactor coolant gross specific activity ≤ $100/\bar{E}$ μCi/gm.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.16.2	-------------------NOTE------------------- Only required to be performed in MODE 1. -- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 µCi/gm.	~~14 days~~ In accordance with the Surveillance Frequency Control Program AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.16.3	-------------------NOTE------------------- Not required to be performed until 31 days after a minimum of 2 Effective Full Power Days (EFPD) and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. -- Determine $\bar{E}$ from a reactor coolant sample taken in MODE 1 after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours.	~~184 days~~ In accordance with the Surveillance Frequency Control Program

THIS MARKUP OF PAGE 3.4.16-2 REFLECTS CHANGES PROPOSED IN A LICENSE AMENDMENT REQUEST DATED DECEMBER 4, 2008, AS SUPPLEMENTED, WHICH IS CURRENTLY BEING REVIEWED BY THE NRC.

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 603 μCi/gm.	~~7 days~~
SR 3.4.16.2	Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	~~14 days~~ AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.17.1	Verify each RCS loop isolation valve is open and power is removed from each loop isolation valve operator.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	Verify borated water level in each accumulator is ≥ 31% and ≤ 63%.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 602 psig and ≤ 647 psig.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2200 ppm and ≤ 2400 ppm.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.1.5	-------------------NOTE------------------- Only required to be performed for affected accumulators after each solution volume increase of ≥ 10% of indicated level that is not the result of addition from the refueling water storage tank containing a boron concentration ≥ 2200 ppm and ≤ 2400 ppm. --- Verify boron concentration in each accumulator is ≥ 2200 ppm and ≤ 2400 ppm.	Once within 6 hours
SR 3.5.1.6	Verify power is removed from each accumulator isolation valve operator.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed: Number / Position / Function MOV SI8806 — Open — Suction to SI Pumps MOV SI8835 — Open — SI Pump Discharge to Reactor Coolant System (RCS) Cold Legs MOV SI8813 — Open — SI Pump Recirculation to the Refueling Water Storage Tank MOV SI8809A — Open — RHR Pump Discharge to RCS Cold Legs MOV SI8809B — Open — RHR Pump Discharge to RCS Cold Legs MOV SI8840 — Closed — RHR Pump Discharge to RCS Hot Legs MOV SI8802A — Closed — SI Pump Discharge to RCS Hot Legs MOV SI8802B — Closed — SI Pump Discharge to RCS Hot Legs	~~12 hours~~
SR 3.5.2.2	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.2.3	Verify ECCS piping is full of water.	~~31 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~18 months~~
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each position stop is in the correct position: <u>Valve Number</u> — <u>Valve Function</u> SI8810 A,B,C,D — Centrifugal Charging System SI8816 A,B,C,D — SI System (Hot Leg) SI8822 A,B,C,D — SI System (Cold Leg)	~~18 months~~
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet screens show no evidence of structural distress or abnormal corrosion.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	-------------------NOTE-------------------- Only required to be performed when ambient air temperature is < 35°F or > 100°F. -- Verify RWST borated water temperature is ≥ 35°F and ≤ 100°F.	~~24 hours~~
SR 3.5.4.2	-------------------NOTE-------------------- Only required to be performed when ambient air temperature is < 35°F. -- Verify RWST vent path temperature is ≥ 35°F.	~~24 hours~~
SR 3.5.4.3	Verify RWST borated water level is ≥ 89%.	~~7 days~~
SR 3.5.4.4	Verify RWST boron concentration is ≥ 2300 ppm and ≤ 2500 ppm.	~~7 days~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	-------------------NOTE-------------------- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig. --- Verify manual seal injection throttle valves are adjusted to give a flow within the limits of Figure 3.5.5-1.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1	-------------------NOTES------------------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1. --- Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	~~24 months~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.3.1 Verify each 48 inch purge valve is sealed closed.	~~31 days~~
SR 3.6.3.2 Verify each 8 inch purge valve is closed, except when the 8 inch containment purge valves are open for purging or venting under administrative controls.	~~31 days~~
SR 3.6.3.3 -------------------NOTE-------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. -- Verify each containment isolation manual valve, remote manual valve, and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	~~31 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.4	------------------NOTE------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -- Verify each containment isolation manual valve, remote manual valve, and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days
SR 3.6.3.5	Verify the isolation time of each automatic containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.6	Perform leakage rate testing for 8 inch containment purge valves with resilient seals.	~~92 days~~
SR 3.6.3.7	Perform leakage rate testing for 48 inch containment purge valves with resilient seals.	~~184 days~~
SR 3.6.3.8	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -0.1 psig and ≤ +1.0 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4.1 Verify containment pressure is within limits.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

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

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.5.1 Verify containment average air temperature is within limit.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. Two containment spray trains inoperable. OR Any combination of three or more trains inoperable.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	~~31 days~~
SR 3.6.6.2	Operate each containment cooling train fan unit for ≥ 15 minutes.	~~31 days~~
SR 3.6.6.3	Verify each containment cooling train cooling water flow rate is ≥ 2660 gpm to each cooler.	~~31 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

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

In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.7 Spray Additive System

LCO 3.6.7 The Spray Additive System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spray Additive System inoperable.	A.1 Restore Spray Additive System to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify each spray additive manual 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 3.6.7.2	Verify spray additive tank solution level is ≥ 78.6% and ≤ 90.3%.	~~184 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.7.3	Verify spray additive tank sodium hydroxide solution concentration is ≥ 30% and ≤ 36% by weight.	~~184 days~~
SR 3.6.7.4	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.6.7.5	Verify spray additive flow rate from each solution's flow path.	~~5 years~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

3.7 PLANT SYSTEMS

3.7.3 Secondary Specific Activity

LCO 3.7.3 The specific activity of the secondary coolant shall be $\leq$ 0.1 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.3.1 Verify the specific activity of the secondary coolant is $\leq$ 0.1 μCi/gm DOSE EQUIVALENT I-131.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify one complete cycle of each SG PORV.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.4.2	Verify one complete cycle of each SG PORV block valve.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each AF manual, power operated, and automatic valve in each water flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.5.2	Verify day tank contains ≥ 420 gal of fuel oil.	~~31 days~~
SR 3.7.5.3	Operate the diesel driven AF pump for ≥ 15 minutes.	~~31 days~~
SR 3.7.5.4	Verify the developed head of each AF pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.7.5.5	Verify each AF automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.5.6	Verify each AF pump starts automatically on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.5.7	Verify proper alignment of the required AF flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5, MODE 6, or defueled for a cumulative period of > 30 days

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.6.1 Verify the CST level is ≥ 66%.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	-------------------NOTE-------------------- Isolation of CC flow to individual components does not render the CC System inoperable. --- Verify each CC manual and power operated valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.7.2	Verify each Essential Service Water System manual and power operated valve directly serving the CC heat exchangers that is not locked, sealed, or otherwise in the correct position, is in the correct position, or can be aligned to the correct position.	~~31 days~~
SR 3.7.7.3	Verify each required CC pump starts automatically on an actual or simulated actuation signal.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	-------------------NOTE-------------------- Isolation of SX flow to individual components does not render the SX System inoperable. -- Verify each unit-specific SX manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	-------------------NOTE-------------------- Not required when opposite unit is in MODE 1, 2, 3, or 4. -- Operate the opposite-unit SX pump for ≥ 15 minutes.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	Cycle each opposite-unit SX crosstie valve that is not secured in the open position with power removed.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.8.4	Verify each unit-specific SX automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.8.5	Verify each unit-specific SX pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. UHS inoperable.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.9.1 Verify water level of UHS is ≥ 590 ft Mean Sea Level (MSL).	~~24 hours~~
SR 3.7.9.2 Verify average water temperature of UHS is ≤ 100°F.	~~24 hours~~
SR 3.7.9.3 Verify bottom level of UHS is ≤ 584 ft MSL.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two VC Filtration System trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies. OR One or more VC Filtration System trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of irradiated fuel assemblies.	E.1 Suspend movement of irradiated fuel assemblies. AND E.2 Suspend positive reactivity additions.	Immediately Immediately
F. Two VC Filtration System trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each VC Filtration System train with: a. Flow through the makeup system filters for ≥ 10 continuous hours with the heaters operating; and b. Flow through the recirculation charcoal adsorber for ≥ 15 minutes.	~~31 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.10.2	Perform required VC Filtration System filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Verify each VC Filtration System train actuates on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.10.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two VC Temperature Control System trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1	Suspend movement of irradiated fuel assemblies.	Immediately
	AND		
	D.2	Suspend positive reactivity additions.	Immediately
E. Two VC Temperature Control System trains inoperable in MODE 1, 2, 3, or 4.	E.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify control room temperature ≤ 90°F.	~~12 hours~~
SR 3.7.11.2	Verify each VC Temperature Control System train has the capability to remove the required heat load.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each Nonaccessible Area Exhaust Filter Plenum Ventilation System train for ≥ 15 minutes.	~~31 days~~
SR 3.7.12.2	Perform required Nonaccessible Area Exhaust Filter Plenum Ventilation System filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.3	Verify each Nonaccessible Area Exhaust Filter Plenum Ventilation System train actuates on a manual, an actual, or a simulated actuation signal.	~~18 months~~
SR 3.7.12.4	Verify two Nonaccessible Area Exhaust Filter Plenum Ventilation System trains can maintain a pressure ≤ -0.25 inches water gauge relative to atmospheric pressure during the emergency mode of operation at a flow rate of ≤ 73,590 cfm per train.	~~18 months on a STAGGERED TEST BASIS~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Two FHB Ventilation System trains inoperable.	C.1	Suspend movement of RECENTLY IRRADIATED FUEL assemblies in the fuel handling building.	Immediately
	AND		
	C.2	--------NOTE--------- Only required with equipment hatch not intact. ---------------------	
		Suspend movement of RECENTLY IRRADIATED FUEL assemblies in the containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each FHB Ventilation System train for ≥ 15 minutes.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

ACTIONS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.13.2	Perform required FHB Ventilation System filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	-------------------NOTE------------------- Only required during movement of RECENTLY IRRADIATED FUEL assemblies with the equipment hatch not intact. -- Verify one FHB Ventilation System train can maintain a pressure ≤ -0.25 inches water gauge relative to atmospheric pressure during the emergency mode of operation.	~~7 days on a STAGGERED TEST BASIS~~
SR 3.7.13.4	Verify each FHB Ventilation System train actuates on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.13.5	-------------------NOTE------------------- Only required during movement of RECENTLY IRRADIATED FUEL assemblies in the fuel handling building with the equipment hatch intact. -- Verify one FHB Ventilation System train can maintain a pressure ≤ -0.25 inches water gauge relative to atmospheric pressure during the emergency mode of operation at a flow rate ≤ 23,100 cfm.	~~18 months on a STAGGERED TEST BASIS~~

In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.14 Spent Fuel Pool Water Level

LCO 3.7.14 The spent fuel pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the spent fuel pool.

ACTIONS

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

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Spent fuel pool water level not within limit.	A.1	Suspend movement of irradiated fuel assemblies in the spent fuel pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14.1	Verify the spent fuel pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.15 Spent Fuel Pool Boron Concentration

LCO 3.7.15 The spent fuel pool boron concentration shall be ≥ 300 ppm.

APPLICABILITY: Whenever fuel assemblies are stored in the spent fuel pool.

ACTIONS

---------------------------------NOTE---------------------------------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent fuel pool boron concentration not within limit.	A.1 Suspend movement of fuel assemblies in the spent fuel pool. AND A.2 Initiate action to restore spent fuel pool boron concentration to within limit.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.15.1 Verify the spent fuel pool boron concentration is within limit.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required qualified circuit.	~~7 days~~
SR 3.8.1.2	-------------------NOTE------------------- A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. Performance of SR 3.8.1.7 satisfies this SR. -- Verify each DG starts from standby condition and achieves steady state voltage $\geq$ 3950 V and $\leq$ 4580 V and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	~~31 days~~
SR 3.8.1.3	-------------------NOTES------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This Surveillance shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. -- Verify each DG is synchronized and loaded and operates for $\geq$ 60 minutes at a load $\geq$ 4950 kW and $\leq$ 5500 kW.	~~31 days~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.4	Verify each day tank contains ≥ 450 gal of fuel oil.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from storage tank(s) to the day tank.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.7	Verify each DG starts from normal standby condition and achieves: a. In ≤ 10 seconds, voltage ≥ 3950 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify manual transfer of AC power sources from the required normal qualified circuit(s) to the reserve required qualified circuit(s).	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1 or 2. -- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 64.5 Hz; b. Following load rejection, the steady state voltage is maintained ≥ 3950 V and ≤ 4580 V; and c. Following load rejection, the steady state frequency is maintained ≥ 58.8 Hz and ≤ 61.2 Hz.	~~18 months~~
SR 3.8.1.10	-------------------NOTES------------------- 1. Momentary transients above the voltage limit immediately following a load rejection do not invalidate this test. 2. This Surveillance shall not be performed in MODE 1 or 2. -- Verify each DG does not trip and voltage is maintained ≤ 4784 V during and following a load rejection of ≥ 4950 kW and ≤ 5500 kW.	~~18 months~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify on an actual or simulated loss of offsite power signal: a. De-energization of ESF buses; b. Load shedding from ESF buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through the shutdown load sequence timers, 3. maintains steady state voltage ≥ 3950 V and ≤ 4580 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In ≤ 10 seconds achieves voltage ≥ 3950 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 3950 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and c. Operates for ≥ 5 minutes.	~~18 months~~
SR 3.8.1.13	Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal except: a. Engine overspeed; and b. Generator differential current.	~~18 months~~
SR 3.8.1.14	-------------------NOTE-------------------- Momentary transients outside the load range do not invalidate this test. -- Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 5775 kW and ≤ 6050 kW; and b. For the remaining hours of the test loaded ≥ 4950 kW and ≤ 5500 kW.	~~18 months~~

(continued)

In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	-------------------NOTES------------------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 4950 kW and ≤ 5500 kW or until operating temperature has stabilized. 2. Momentary transients outside of load range do not invalidate this test. --- Verify each DG starts and achieves: a. In ≤ 10 seconds, voltage ≥ 3950 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.16	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. --- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.18	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify interval between each sequenced load block is within ± 10% of design interval for each safeguards and shutdown sequence timer.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of ESF buses; b. Load shedding from ESF buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through the safeguards sequence timers, 3. achieves steady state voltage ≥ 3950 V and ≤ 4580 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~18 months~~
SR 3.8.1.20	Verify when started simultaneously from standby condition, each DG achieves: a. In ≤ 10 seconds, voltage ≥ 3950 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~10 years~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Conditions A, B, or C not met. <u>OR</u> One or more DGs with diesel fuel oil not within limits for reasons other than Condition A, B, or C.	D.1 Declare associated DG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each DG fuel oil storage tank(s) contains ≥ 44,000 gal of fuel.	~~31 days~~
SR 3.8.3.2	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 3.8.3.3	Check for and remove accumulated water from each fuel oil storage tank.	~~31 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 battery charger supplies a load equal to the manufacturer's rating at greater than or equal to the minimum established float voltage for ≥ 8 hours. <u>OR</u> Verify each battery charger can recharge the battery to the fully charged state within 24 hours while supplying the largest coincident demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	~~18 months~~
SR 3.8.4.3	-------------------NOTES------------------- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of the service test in SR 3.8.4.3. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. --- Verify battery capacity is adequate to supply, and maintain OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~18 months~~

In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, D or E not met. OR One battery with one or more cells with float voltage < 2.07 V and float current > 3 amps.	F.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	-------------------NOTE------------------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. -- Verify each battery float current is ≤ 3 amps.	In accordance with the Surveillance Frequency Control Program ~~7 days~~
SR 3.8.6.2	Verify each battery pilot cell float voltage is ≥ 2.07 V.	~~31 days~~
SR 3.8.6.3	Verify each battery 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 electrolyte temperature is greater than or equal to minimum established design limits.	~~31 days~~
SR 3.8.6.5	Verify each battery cell float voltage is ≥ 2.07 V.	~~92 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.6	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program ~~60 months~~ <u>AND</u> 12 months when battery shows degradation or has reached 85% of the expected life with capacity < 100% of manufacturer's rating <u>AND</u> 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage and breaker alignment to AC instrument buses.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required inverters to OPERABLE status.	Immediately
	<u>AND</u>	
	A.2.5 Declare affected Low Temperature Overpressure Protection feature(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.8.1 Verify correct inverter voltage and breaker alignment to required AC instrument buses.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two electrical power distribution subsystems inoperable that result in a loss of safety function.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to AC, DC, and AC instrument bus electrical power distribution subsystems.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC instrument bus electrical power distribution subsystems.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of the Reactor Coolant System, the refueling canal, and the refueling cavity shall be maintained within the limit specified in the COLR.

APPLICABILITY: MODE 6.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.1.1 Verify boron concentration is within the limit specified in the COLR.	~~72 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.2.1 Verify each valve that isolates unborated water sources is secured in the closed position.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.9.3.2	-------------------NOTE-------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend movement of RECENTLY IRRADIATED FUEL assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	~~7 days~~
SR 3.9.4.2	Verify each required containment purge valve actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~
SR 3.9.4.3	Verify the isolation time of each required containment purge valve is within limits.	In accordance with the Inservice Testing Program

In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.5.1 Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 1000 gpm.	~~12 hours~~ $\boxed{\text{In accordance with the Surveillance Frequency Control Program}}$

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No RHR loop in operation.	B.1 Suspend operations involving a reduction in reactor coolant boron concentration.	Immediately
	<u>AND</u>	
	B.2 Initiate action to restore one RHR loop to operation.	Immediately
	<u>AND</u>	
	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

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

In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.7 Refueling Cavity Water Level

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

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.7.1 Verify refueling cavity water level is ≥ 23 ft above the top of reactor vessel flange.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.18 Control Room Envelope Habitability Program (continued)

a. The definition of the CRE and CRE boundary.

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

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

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

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

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

5.5.19 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

Braidwood Station, Units 1 and 2

Facility Operating License Nos. NPF-72 and NPF-77

<u>REVISED TECHNICAL SPECIFICATIONS BASES PAGES</u>
(NOTE: TS Bases pages are provided for information only.)

B 3.1.1-6	B 3.3.2-57	B 3.4.12-15	B 3.6.7-4	B 3.8.1-21
B 3.1.2-6	B 3.3.3-15	B 3.4.12-16	B 3.6.7-5	B 3.8.1-22
B 3.1.4-12	B 3.3.3-16	B 3.4.12-17	B 3.6.7-6	B 3.8.1-24
B 3.1.4-13	B 3.3.4-4	B 3.4.13-7	B 3.7.2-6	B 3.8.1-25
B 3.1.5-5	B 3.3.5-5	B 3.4.13-8	B 3.7.3-4	B 3.8.1-26
B 3.1.6-6	B 3.3.6-6	B 3.4.14-6	B 3.7.4-5	B 3.8.1-27
B 3.1.6-7	B 3.3.6-7	B 3.4.14-8	B 3.7.5-6	B 3.8.1-28
B 3.1.8-9	B 3.3.6-8	B 3.4.15-6	B 3.7.5-7	B 3.8.1-29
B 3.1.8-10	B 3.3.6-9	B 3.4.15-7	B 3.7.5-8	B 3.8.1-30
B 3.2.1-8	B 3.3.7-5	B 3.4.16-5	B 3.7.6-4	B 3.8.1-31
B 3.2.1-11	B 3.3.7-6	B 3.4.16-6	B 3.7.7-6	B 3.8.3-5
B 3.2.1-12	B 3.3.8-4	B 3.4.17-5	B 3.7.7-7	B 3.8.3-7
B 3.2.2-1	B 3.3.8-5	B 3.5.1-8	B 3.7.8-6	B 3.8.4-11
B 3.2.2-7	B 3.3.9-4	B 3.5.1-9	B 3.7.8-7	B 3.8.4-12
B 3.2.2-8	B 3.3.9-5	B 3.5.1-10	B 3.7.9-3	B 3.8.4-13
B 3.2.3-4	B 3.3.9-6	B 3.5.2-9	B 3.7.9-4	B 3.8.6-7
B 3.2.4-6	B 3.3.9-7	B 3.5.2-10	B 3.7.10-8	B 3.8.6-8
B 3.2.4-7	B 3.4.1-4	B 3.5.2-11	B 3.7.10-9	B 3.8.6-9
B 3.2.5-4	B 3.4.1-5	B 3.5.2-12	B 3.7.11-5	B 3.8.7-4
B 3.3.1-52	B 3.4.2-3	B 3.5.4-7	B 3.7.12-7	B 3.8.8-5
B 3.3.1-53	B 3.4.3-8	B 3.5.4-8	B 3.7.12-8	B 3.8.9-10
B 3.3.1-54	B 3.4.4-5	B 3.5.5-4	B 3.7.12-9	B 3.8.10-4
B 3.3.1-55	B 3.4.5-7	B 3.6.2-10	B 3.7.13-6	B 3.9.1-5
B 3.3.1-56	B 3.4.5-8	B 3.6.3-14	B 3.7.13-7	B 3.9.2-4
B 3.3.1-57	B 3.4.6-5	B 3.6.3-15	B 3.7.13-8	B 3.9.3-4
B 3.3.1-58	B 3.4.7-5	B 3.6.3-16	B 3.7.14-3	B 3.9.4-6
B 3.3.1-59	B 3.4.7-6	B 3.6.3-18	B 3.7.15-6	B 3.9.4-7
B 3.3.1-61	B 3.4.8-4	B 3.6.3-19	B 3.8.1-15	B 3.9.5-4
B 3.3.2-51	B 3.4.9-5	B 3.6.4-4	B 3.8.1-16	B 3.9.6-4
B 3.3.2-52	B 3.4.9-6	B 3.6.5-4	B 3.8.1-17	B 3.9.7-3
B 3.3.2-53	B 3.4.11-8	B 3.6.6-9	B 3.8.1-18	
B 3.3.2-54	B 3.4.11-9	B 3.6.6-10	B 3.8.1-19	
B 3.3.2-55	B 3.4.12-14	B 3.6.6-11	B 3.8.1-20	

ACTIONS (continued)

In determining the boration flow rate, the time in core life must be considered. For instance, the most difficult time in core life to increase the RCS boron concentration is at the beginning of life when the boron concentration may approach or exceed 2000 ppm. Assuming that a value of 1% $\Delta k/k$ must be recovered and a boration flow rate of 30 gpm, it is possible to increase the boron concentration of the RCS by 123 ppm in approximately 74 minutes assuming a 7000 ppm boric acid solution. If a boron worth of 8.12 pcm/ppm is assumed, this combination of parameters will increase the SDM by 1% $\Delta k/k$. These boration parameters of 30 gpm and 7000 ppm represent typical values and are provided for the purpose of offering a specific example.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

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

a. RCS boron concentration;

b. Control bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal Temperature Coefficient (ITC).

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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. UFSAR, Section 15.1.5.
3. UFSAR, Section 15.4.6.
4. UFSAR, Section 15.4.1.
5. UFSAR, Section 15.4.2.
6. UFSAR, Section 15.4.8.
7. 10 CFR 50.67.

BASES

ACTIONS (continued)

B.1

If the core reactivity cannot be restored to within the 1% Δk/k limit, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then the boration required by SR 3.1.1.1 would occur. The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made considering that other core conditions are fixed or stable, including control rod position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 after each refueling as an initial check on core conditions and design calculations at BOL.

SR 3.1.2.2

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made considering that other core conditions are fixed or stable, including control rod position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. ~~The required Frequency of 31 Effective Full Power Days (EFPD) is acceptable based on the slow rate of core changes due to fuel depletion and the presence of other indicators (QPTR, AFD, etc.) for prompt indication of an anomaly.~~

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

ACTIONS (continued)

D.1

When Required Actions of Condition B or C.3 cannot be completed within their Completion Time, the unit must be brought to a MODE or Condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours, which obviates concerns about the development of undesirable xenon or power distributions. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging the plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual rod positions are within alignment limits ~~at a Frequency of 12 hours~~ provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. When a rod's alignment cannot be verified due to a DRPI failure, the position of the rod can be determined by use of the movable incore detectors and/or PDMS. The position of the rod may be determined from the difference between the measured core power distribution and the core power distribution expected to exist based on the position of the rod indicated by the group step counter demand position.

~~This frequency takes into account other rod position information that is continuously available to the operator in the control room, so that during actual rod motion, deviations can immediately be detected.~~

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 3.1.4.2

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

SR 3.1.4.3

Verification of rod drop times allows the operator to determine that the maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analysis. Measuring rod drop times once prior to reactor criticality, after reactor vessel head removal, ensures that the reactor internals and rod drive mechanism will not interfere with rod motion or rod drop time, and that no degradation in these systems has occurred that would adversely affect control rod motion or drop time. This testing is performed with all Reactor Coolant Pumps (RCPs) operating and the average moderator temperature ≥ 550°F to ensure that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

This Surveillance is performed during a unit outage, due to conditions needed to perform the SR and the potential for an unplanned unit transient if the Surveillance were performed with the reactor at power.

BASES

ACTIONS (continued)

B.1

If Required Actions A.1 and A.2 and their associated Completion Times are not met, the unit must be brought to a MODE where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

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

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

REFERENCES

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

BASES

ACTIONS (continued)

C.1

If Required Actions A.1 and A.2, or B.1 and B.2 cannot be completed within the associated Completion Times, the unit must be brought to MODE 2 with $k_{eff} < 1.0$, where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

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

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

SR 3.1.6.2

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

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)

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 3.1.6.3

When control banks are maintained within their insertion limits as checked by SR 3.1.6.2 above, it is unlikely that their sequence and overlap will not be in accordance with requirements provided in the COLR. ~~A Frequency of 12 hours is consistent with the insertion limit check above in SR 3.1.6.2.~~

REFERENCES

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

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 3.1.8.2

Verification that the RCS lowest loop T_{avg} is ≥ 530°F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. ~~Verification of the RCS temperature at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.~~

SR 3.1.8.3

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

SR 3.1.8.4

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

a. RCS boron concentration;

b. Control bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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 B, SECTION XI.
2. 10 CFR 50.59.
3. Regulatory Guide 1.68, Revision 2, August, 1978.
4. ANSI/ANS-19.6.1-1985, December 13, 1985.
5. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology Report," July 1985.
6. UFSAR Section 14.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.1

Verification that $F_Q^C(Z)$ is within its specified limits involves increasing $F_Q^M(Z)$ to allow for manufacturing tolerance and measurement uncertainties in order to obtain $F_Q^C(Z)$. Specifically, $F_Q^M(Z)$ is the measured value of $F_Q(Z)$ obtained from incore flux map results and $F_Q^C(Z) = F_Q^M(Z) * (1.0815)$ (Ref. 6). $F_Q^C(Z)$ is then compared to its specified limits.

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

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

If THERMAL POWER has been increased by ≥ 10% RTP since the last determination of $F_Q^C(Z)$, another evaluation of this factor is required 12 hours after achieving equilibrium conditions at this higher power level (to ensure that $F_Q^C(Z)$ values are being reduced sufficiently with power increase to stay within the LCO limits).

Typically, the top and bottom 15% of the core are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analysis and because of the difficulty of making a precise measurement in these regions. However, the top and bottom exclusion zones can be reduced to 8% if the predicted transient peak $F_Q(Z)$ is located within the top and bottom 8% to 15% of the core. The reduction of the top and bottom exclusion zones from 15% to 8% of the core still meets the $F_Q^C(Z)$ measurement uncertainty of 5%.

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 Effective Full Power Days (EFPD) is adequate to monitor the change of power distribution with core burnup because such changes are slow and well controlled when the unit is operated in accordance with the Technical Specifications (TS).~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

These alternative requirements prevent $F_Q(Z)$ from exceeding its limit for any significant period of time without detection.

Note 3 requires the measured value of $F_Q^W(Z)$ be obtained from incore flux map results only when PDMS is inoperable. Note 3 modifies the required performance of the Surveillance and states that this Surveillance is not required to be performed until 12 hours after declaring PDMS inoperable, and that the last performance of SR 3.2.1.4 prior to declaring PDMS inoperable satisfies the initial performance of this SR after declaring PDMS inoperable. If SR 3.2.1.2 were not performed within its specified Frequency, this Note allows 12 hours to verify $F_Q^W(Z)$ is within limit using either the incore flux map results or by taking credit for the last performance of SR 3.2.1.4 when PDMS was OPERABLE.

Performing the Surveillance in MODE 1 prior to exceeding 75% RTP ensures that the $F_Q(Z)$ limit is met when RTP is achieved, because peaking factors are generally decreased as power level is increased.

$F_Q(Z)$ is verified at power levels ≥ 10% RTP above the THERMAL POWER of its last verification, 12 hours after achieving equilibrium conditions to ensure that $F_Q(Z)$ is within its limit at higher power levels.

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

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

SR 3.2.1.3

The confirmation of the power distribution parameter, $F_Q^C(Z)$, is an additional verification over the automated monitoring performed by PDMS. This assures that PDMS is functioning properly and that the core limits are met.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~The Surveillance Frequency of 7 days takes into account other information and alarms available to the operator in the control room, and is adequate because $F_Q(Z)$ is monitored by the process computer.~~

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 that requires the performance of SR 3.2.1.3 for determining $F_Q^C(Z)$ only when PDMS is OPERABLE.

SR 3.2.1.4

The confirmation of the power distribution parameter, $F_Q^W(Z)$, is an additional verification over the automated monitoring performed by PDMS. This assures that PDMS is functioning properly and that the core limits are met.

~~The Surveillance Frequency of 7 days takes into account other information and alarms available to the operator in the control room, and is adequate because $F_Q(Z)$ is monitored by the process computer.~~

This Surveillance is modified by a Note that requires the performance of SR 3.2.1.4 for determining $F_Q^W(Z)$ only when PDMS is OPERABLE.

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Section 15.4.8.
3. 10 CFR 50, Appendix A, GDC 26.
4. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.
5. ANSI/ANS-19.6.1-1985, "Reload Startup Physics Test for Pressurized Water Reactors," December 13, 1985.
6. WCAP-7308-L-P-A, "Evaluation of Nuclear Hot Channel Factor Uncertainties," June 1988.
7. WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control (and) F_Q Surveillance Technical Specification," February 1994.

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.2 Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)

BASES

BACKGROUND

The purpose of this LCO is to establish limits on the power density at any point in the core so that the fuel design criteria are not exceeded and the accident analysis assumptions remain valid. The design limits on local (pellet) and integrated fuel rod peak power density are expressed in terms of hot channel factors. Control of the core power distribution with respect to these factors ensures that local conditions in the fuel rods and coolant channels do not challenge core integrity at any location in the core during either normal operation or a postulated accident analyzed in the safety analyses.

$F^N_{\Delta H}$ is defined as the ratio of the integral of the linear power along the fuel rod with the highest integrated power to the average integrated fuel rod power. Therefore, $F^N_{\Delta H}$ is a measure of the maximum total power produced in a fuel rod.

$F^N_{\Delta H}$ is sensitive to fuel loading patterns, control bank insertion, and fuel burnup. $F^N_{\Delta H}$ typically increases with control bank insertion and typically decreases with fuel burnup.

When Power Distribution Monitoring System (PDMS) is inoperable, $F^N_{\Delta H}$ is not directly measurable but is inferred from a power distribution map obtained with the movable incore detector system. Specifically, the results of the three dimensional power distribution map are analyzed by a computer to determine $F^N_{\Delta H}$. ~~This factor is calculated at least every 31 Effective Full Power Days (EFPD).~~ However, during power operation when PDMS is inoperable, the global power distribution is monitored by LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," which address directly and continuously measured process variables. During power operation when PDMS is OPERABLE, the linear power along the fuel rod with the highest integrated power is measured continuously and $F^N_{\Delta H}$ is determined continuously.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

The value of $F^N_{\Delta H}$ is determined by using the movable incore detector system to obtain a flux distribution map. A data reduction computer program then calculates the maximum value of $F^N_{\Delta H}$ from the measured flux distributions. The measured value of $F^N_{\Delta H}$ must be multiplied by 1.04 to account for measurement uncertainty before making comparisons to the $F^N_{\Delta H}$ limit.

After each refueling, $F^N_{\Delta H}$ must be determined in MODE 1 prior to exceeding 75% RTP. This requirement ensures that $F^N_{\Delta H}$ limits are met at the beginning of each fuel cycle.

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

This Surveillance has been modified by a Note. The Note requires the measured value of $F^N_{\Delta H}$ be obtained from incore flux map results only when PDMS is inoperable. The Note modifies the required performance of the Surveillance and states that this Surveillance is not required to be performed until 12 hours after declaring PDMS inoperable, and that the last performance of SR 3.2.2.2 prior to declaring PDMS inoperable satisfies the initial performance of this SR after declaring PDMS inoperable. If SR 3.2.2.1 were not performed within its specified Frequency, this Note allows 12 hours to verify $F^N_{\Delta H}$ is within limit using either the incore flux map results or by taking credit for the last performance of SR 3.2.2.2 when PDMS was OPERABLE.

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 3.2.2.2

The confirmation of the power distribution parameter, $F^N_{\Delta H}$, is an additional verification over the automated monitoring performed by PDMS. This assures that PDMS is functioning properly and that the core limits are met.

~~The Surveillance Frequency of 7 days takes into account other information and alarms available to the operator in the control room, and is adequate because~~ $\cancel{F^N_{\Delta H}}$ ~~is monitored by the process computer.~~

This Surveillance is modified by a Note that requires the performance of SR 3.2.2.2 for determining $F^N_{\Delta H}$ only when PDMS is OPERABLE.

REFERENCES

1. UFSAR, Section 15.4.8.
2. 10 CFR 50, Appendix A, GDC 26.
3. 10 CFR 50.46.

BASES

ACTIONS

A.1

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

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

This Surveillance verifies that the AFD as indicated by the NIS excore channels is within limits. ~~The Surveillance Frequency of 7 days is adequate because the AFD is controlled by the operator and monitored by the process computer.~~

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 AFD should be monitored and logged more frequently in periods of operation for which the power level or control bank positions are changing to allow corrective measures when the AFD is more likely to move outside limits.

A Note modifies the required performance of the Surveillance and states that this Surveillance is not required to be performed until 12 hours after declaring PDMS inoperable. If SR 3.2.3.1 were not performed within its specified Frequency, this Note allows 12 hours to verify AFD is within limits.

REFERENCES

1. WCAP-8403 (nonproprietary), "Power Distribution Control and Load Following Procedures," Westinghouse Electric Corporation, September 1974.

2. R. W. Miller et al., "Relaxation of Constant Axial Offset Control: F_Q Surveillance Technical Specification," WCAP-10217(NP), June 1983.

3. UFSAR, Section 7.7.1.3.1.

BASES

ACTIONS (continued)

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

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1

This Surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) excore channels, is within its limits. ~~The Frequency of 7 days takes into account other information and alarms available to the operator in the control room.~~ 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 three Notes. Note 1 allows QPTR to be calculated with three power range channels if THERMAL POWER is ≤ 75% RTP and the input from one Power Range Neutron Flux channel is inoperable. Note 2 allows performance of SR 3.2.4.2 in lieu of SR 3.2.4.1. Note 3 modifies the required performance of the Surveillance and states that this Surveillance is not required to be performed until 12 hours after declaring PDMS inoperable. If SR 3.2.4.1 were not performed within its specified Frequency, this Note allows 12 hours to verify QPTR is within limits.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.4.2

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

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.

For purposes of monitoring the QPTR when input from one power range channel is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. The incore detector monitoring is performed with a full incore flux map or two sets of four thimble locations with quarter core symmetry. The two sets of four symmetric thimbles is a set of eight unique detector locations.

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

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.5.1

The confirmation of the power distribution parameter, DNBR, is an additional verification over the automated monitoring performed by PDMS. This assures that PDMS is functioning properly and that the core limits are met.

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 of 7 days takes into account other information and alarms available to the operator in the control room, and is adequate because DNBR is monitored by the process computer.~~

REFERENCES

1. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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

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

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the NIS channel output ~~every 24 hours~~. If the calorimetric exceeds the NIS channel output by > 2% RTP, the NIS is not declared inoperable, but must be adjusted. If the NIS channel output cannot be properly adjusted, the channel is declared inoperable.

Two Notes modify SR 3.3.1.2. The first Note indicates that the NIS channel output shall be adjusted consistent with the calorimetric results if the absolute difference between the NIS channel output and the calorimetric is > 2% RTP. The second Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 12 hours is allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are inaccurate.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~The Frequency of every 24 hours is adequate. It is based on plant operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate the change in the absolute difference between NIS and heat balance calculated powers rarely exceeds 2% in any 24 hour 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.

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

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output prior to exceeding 75% RTP after each refueling and ~~every 31 Effective Full Power days (EFPD)~~ periodically thereafter. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted.

If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the Overtemperature ΔT Function.

Two Notes modify SR 3.3.1.3. Note 1 indicates that the excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%. Note 2 clarifies that the Surveillance is required only if reactor power is > 15% RTP.

The Frequency of once prior to exceeding 75% RTP following each refueling outage considers that the core may be changed during a refueling outage such that the previous comparison, prior to the refueling outage, is no longer completely valid. The Frequency also considers that the comparison accuracy increases with power level such that the comparison is preferred to be performed at as high a power level as possible. An initial performance at ≤ 75% RTP provides a verification prior to attaining full power.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT ~~every 62 days on a STAGGERED TEST BASIS~~. This test shall verify OPERABILITY by actuation of the end devices.

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.13. The bypass breaker test shall include a local shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

~~The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 15.~~

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 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested ~~every 92 days on a STAGGERED TEST BASIS~~, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. ~~The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 15.~~

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to agree with the incore measurements. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the Overtemperature ΔT Function.

BASES

SURVEILLANCE REQUIREMENTS (continued)

A Note modifies SR 3.3.1.6. The Note states that this Surveillance is required only if reactor power is ≥ 75% RTP and that 24 hours is allowed for performing the first surveillance after reaching 75% RTP.

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

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 3.3.1.7

SR 3.3.1.7 is the performance of a COT ~~every 184 days~~. A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be within the Allowable Values specified in Table 3.3.1-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the calculated normal uncertainties consistent with the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current plant specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis (Ref. 7) when applicable.

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

~~The Frequency of 184 days is justified in Reference 15.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within

the Frequency specified in the Surveillance Frequency Control Program

~~184 days of the Frequencies~~ prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "4 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency

specified in the Surveillance Frequency Control Program

~~of every 184 days~~ thereafter applies if the unit remains in the MODE of Applicability after the initial performances of prior to reactor startup and four hours after reducing power below P-10 or P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 4 hour limit. Four hours is a reasonable time to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > 4 hours.

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 3.3.1.9

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

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

SR 3.3.1.10

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

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the plant specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the calculated normal uncertainties consistent with the setpoint methodology.

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

SR 3.3.1.10 is modified by a Note stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION~~,~~ as described in SR 3.3.1.10~~, every 18 months~~. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the power range neutron detectors consists of a normalization of the detectors based on a power calorimetric and flux map performed above 15% RTP, and obtaining detector plateau curves, evaluating those curves, and comparing the curves to the manufacturer's data. The CHANNEL CALIBRATION for the source range, intermediate range, and power range neutron detectors consists of obtaining the detector plateau or preamp discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data. This Surveillance is not required for the NIS power range detectors for entry into MODE 2 or 1, and is not required for the NIS intermediate range detectors for entry into MODE 2, because the unit must be in at least MODE 2 to perform the test for the intermediate range detectors and MODE 1 for the power range detectors. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.~~

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 3.3.1.12

SR 3.3.1.12 is the performance of a COT of RTS interlocks ~~every 18 months~~.

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

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 3.3.1.13

SR 3.3.1.13 is the performance of a TADOT of the Manual Reactor Trip, RCP Breaker Position, and the SI Input from ESFAS. ~~This TADOT is performed every 18 months.~~ The test shall independently verify the OPERABILITY of the Undervoltage and Shunt Trip Mechanisms for the Manual Reactor Trip Function for the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip.

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

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

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of Turbine Trip Functions. This TADOT is performed prior to reactor startup. A Note states that this Surveillance is required if it has not been performed once within the previous 31 days. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the Turbine Trip Function is OPERABLE prior to taking the reactor critical. This test cannot be performed with the reactor at power and must therefore be performed prior to reactor startup.

SR 3.3.1.15

SR 3.3.1.15 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in the UFSAR, Section 7.2 (Ref. 9). Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment reaches the required functional state.

SURVEILLANCE REQUIREMENTS (continued)

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function set to one, with the resulting measured response time compared to the appropriate UFSAR response time. Alternately, the response time test can be performed with the time constants set to their nominal value, provided the required response time is analytically calculated assuming the time constants are set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing, and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. Reference 8 provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

Reference 12 provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

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.

~~As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.3.1.15 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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

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

SR 3.3.2.2

SR 3.3.2.2 is the performance of a COT ~~every 31 days~~. A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the calculated normal uncertainty consistent with the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current plant specific setpoint methodology.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis (Ref. 7) when applicable.

~~The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data.~~

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 3.3.2.3

SR 3.3.2.3 is the performance of a TADOT ~~every 31 days~~. This test is a check of the Loss of Offsite Power Function. The Function is tested up to, and including, the master relay coils.

The SR is modified by a Note that excludes verification of setpoints for relays. Relay setpoints require elaborate bench calibration and are verified during CHANNEL CALIBRATION. ~~The Frequency is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.~~

SR 3.3.2.4

SR 3.3.2.4 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested ~~every 92 days on a STAGGERED TEST BASIS,~~ using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. ~~The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 16.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.5

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 3.3.2.5 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. ~~This test is performed every 92 days on a STAGGERED TEST BASIS.~~ The time allowed for the testing (4 hours) is justified in Reference 7. ~~The frequency of 92 days is justified in Reference 16.~~

SR 3.3.2.6

SR 3.3.2.6 is the performance of a COT.

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

The difference between the current "as found" values and the previous test "as left" values must be consistent with the calculated normal uncertainty consistent with the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current plant specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 16.

~~The Frequency of 184 days is justified in Reference 16.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.7

SR 3.3.2.7 is the performance of a TADOT ~~every 92 days~~. This test is a check of the Undervoltage RCP Function. The Function is tested up to, and including, the master relay coils.

The test also includes trip devices that provide actuation signals directly to the SSPS. The SR is modified by a Note that excludes verification of setpoints for relays. Relay setpoints require elaborate bench calibration and are verified during CHANNEL CALIBRATION. ~~The Frequency is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.~~

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 3.3.2.8

SR 3.3.2.8 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay.

~~This test is performed every 18 months. The Frequency of 18 months is based on the reliability analyses described in References 12, 13, and 14. These reliability analyses were performed for the Westinghouse Type AR relays and for the Potter & Brumfield MDR Series relays used for the slave and auxiliary relays in the ESFAS circuit.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.9

SR 3.3.2.9 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and P-4 Reactor Trip Interlock. ~~It is performed every 18 months.~~ Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). ~~The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle.~~ The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions have no associated setpoints.

SR 3.3.2.10

SR 3.3.2.10 is the performance of a CHANNEL CALIBRATION.

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

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 CALIBRATIONS must be performed consistent with the assumptions of the plant specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.

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

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

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.11 and SR 3.3.2.12

These SRs ensure the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in the UFSAR, Section 7.3, (Ref. 9). Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer functions set to one with the resulting measured response time compared to the appropriate UFSAR response time. Alternately, the response time test can be performed with the time constants set to their nominal value provided the required response time is analytically calculated assuming the time constants are set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing, and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. Reference 8 provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Reference 11 provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

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.

~~ESF RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS with the exception of Function 6.d. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every 18 months. Function 6.d is associated with the start of the motor-driven auxiliary feedwater pump only (Train A). Therefore, a Frequency of 18 months is specified. The 18 month Frequency is consistent with the typical refueling cycle and is based on plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~

BASES

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SR 3.3.3.1

Performance of the CHANNEL CHECK once ~~every 31 days~~ ensures that a gross instrumentation failure has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared to similar instruments located throughout the plant.

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

As specified in the SR, a CHANNEL CHECK is only required for those channels that are normally energized.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.2

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. The CHANNEL CALIBRATION may consist of an electronic calibration of the channel for range decades above 10 R/h and a one point calibration check of the detector below 10 R/h with an installed or portable gamma source.

This SR is modified by a Note that excludes the radiation detector for Function 11, Containment Area Radiation. For this Function, the CHANNEL CALIBRATION may consist of an electronic calibration of the remainder of the channel for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with an installed or portable gamma source. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the CETC sensors, which may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel, is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element. ~~The Frequency is based on operating experience and consistency with the typical industry refueling cycle.~~

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

SR 3.3.4.1

Performance of the CHANNEL CHECK ~~once every 31 days~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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

As specified in the Surveillance, a CHANNEL CHECK is only required for those channels which are normally energized. ~~The Frequency of 31 days is based upon operating experience which demonstrates that 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 3.3.4.2

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

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

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 19.

BASES

ACTIONS (continued)

C.1

Condition C applies to each of the LOP DG Start Instrumentation Functions when the Required Action and associated Completion Time for Condition A or B are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources-Operating," or LCO 3.8.2, "AC Sources-Shutdown," for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure plant safety.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

SR 3.3.5.1 is the performance of a TADOT. ~~This test is performed every 31 days.~~ The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. ~~The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~ The SR is modified by a Note that excludes verification of relay setpoints during the TADOT.

SR 3.3.5.2

SR 3.3.5.2 is the performance of a CHANNEL CALIBRATION.

The setpoints, as well as the response to a loss of voltage and a degraded voltage test, shall include a single point verification that the trip occurs within the required time delay, as described in Reference 1.

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

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

BASES

ACTIONS (continued)

C.1 and C.2

Condition C addresses the failure of both radiation monitoring channels or the inability to restore a single failed channel to OPERABLE status in the time allowed for Required Action A.1. If both channels are inoperable or the Required Action and associated Completion Time of Condition A is not met, operation may continue as long as the Required Action to place and maintain containment purge valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is immediately.

A Note states that Condition C is only applicable when Item C.2 of LCO 3.9.4 is required.

SURVEILLANCE REQUIREMENTS

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

SR 3.3.6.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

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

SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. ~~This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 6.~~

The SR has been modified by a Note stating that the Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation.

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. ~~This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 6.~~

The SR has been modified by a Note stating that the Surveillance is only applicable to the master relays of the ESFAS Instrumentation.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.4

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

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

SR 3.3.6.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay.

~~This test is performed every 18 months. The Frequency of 18 months is based on the reliability analyses described in References 3, 4, and 5. These reliability analyses were performed for the Westinghouse Type AR relays and for the Potter & Brumfield MDR Series relays used for the slave and auxiliary relays in the Containment Ventilation Isolation Instrumentation circuit.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.6

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

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

REFERENCES

1. 10 CFR 50.67.

2. NUREG-1366, December 1992.

3. WCAP-13877, Revision 2-P, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays," October 1999.

4. WCAP-13878-P, Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," October 1999.

5. WCAP-13900, Revision 0, "Extension of Slave Relay Surveillance Test Intervals," April 1994.

6. WCAP-15376-P-A, Revision 1, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," March 2000.

BASES

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1 determines which SRs apply to which VC Filtration System Actuation Function.

SR 3.3.7.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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

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

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 3.3.7.2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.3

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

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

REFERENCES None.

BASES

ACTIONS (continued)

Alternative actions may be taken if the FHB Ventilation System train is not placed in emergency mode or does not have an associated OPERABLE diesel generator. Required Action B.2.1 requires the suspension of fuel movement of RECENTLY IRRADIATED FUEL assemblies in the Fuel Handling Building, precluding a fuel handling accident. Required Action B.2.2 requires suspending movement of RECENTLY IRRADIATED FUEL assemblies inside containment, precluding an accident that would require FHB Ventilation System actuation when the equipment hatch is not intact. These actions do not preclude the movement of fuel assemblies to a safe position.

Required Action B.2.2 is modified by a Note which indicates that this Required Action is only required if the equipment hatch is not intact. If the hatch is intact, only Required Action B.2.1 is required.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.8-1 determines which SRs apply to which Fuel Handling Building (FHB) Radiation Actuation Functions.

SR 3.3.8.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

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 3.3.8.2

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

SR 3.3.8.3

~~A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. ~~The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.~~

REFERENCES 1. 10 CFR 50.67.

BASES

ACTIONS (continued)

C.1, C.2, and C.3

With two Boron Dilution Alert channels inoperable, no Reactor Coolant Pump in operation, or one or more RCS loop isolation valve(s) not open, unborated water source isolation valves CV111B, CV8428, CV8441, CV8435, and CV8439 are required to be closed and secured within 1 hour to prevent the flow of unborated water into the RCS. The 1 hour Completion Time takes into consideration the time to close and secure open isolation valves. The isolation valves are also required to be verified closed and secured once every 12 hours. The Completion Time of "once per 12 hours" is appropriate considering the fact that the isolation valves are operated under administrative controls and confirms that the unborated water source isolation valves are in their correct position.

Required Action C.2 accompanies Required Actions C.1 and C.3 to verify the SDM according to SR 3.1.1.1 within 1 hour and once per 12 hours thereafter. This action is intended to confirm that no unintended boron dilution has occurred while the BDPS was inoperable, and that the required SDM has been maintained. The specified Completion Time takes into consideration sufficient time for the initial determination of SDM and other information available in the control room related to SDM.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 and SR 3.3.9.2

These SRs require verification ~~every 12 hours~~ that at least one Reactor Coolant Pump is in operation and the RCS loop isolation valves are open. Proper mixing of RCS coolant in the reactor cannot be assured with less than one Reactor Coolant Pump running. Without proper mixing, BDPS may be inadequate to allow the operator to recognize and terminate a dilution event. Having RCS isolation valves closed presents the possibility that the isolated loop represents a dilution source that is not analyzed.

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 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS loop performance.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.3

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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

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

SR 3.3.9.4

SR 3.3.9.4 verifies that each Boron Dilution Alert channel selector switch is in the Normal position ~~once every 12 hours~~. Having the Boron Dilution Alert channel selector switch in the Normal position enables the Boron Dilution Alert alarm.

~~The Frequency of 12 hours is sufficient considering other indications and alarms available in the control room to alert the operator of an inadvertent boron dilution event.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.5

Verifying the correct alignment for manual, power operated, and automatic valves in the BDPS flow path provides assurance that the proper flow paths will exist for BDPS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves capable of potentially being mispositioned are in the correct 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.

SR 3.3.9.6

SR 3.3.9.6 is the performance of a COT.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.9-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the calculated normal uncertainty consistent with the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current plant specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis (Ref. 2) when applicable.

~~The Frequency of 92 days is justified in Reference 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.7

SR 3.3.9.7 is the performance of a CHANNEL CALIBRATION ~~every 18 months.~~ CHANNEL CALIBRATION is a complete check of the instrument loop. This SR is modified by a Note stating that the CHANNEL CALIBRATION is only required to include that portion of the channel associated with the Boron Dilution Alert function. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

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 is based on operating experience and consistency with the typical industry refueling cycle.~~

REFERENCES

1. UFSAR, Chapter 15.

2. WCAP-10271-P-A, Supplement 2, Revision 1, June 1990.

BASES

ACTIONS

A.1

RCS pressure and RCS average temperature are controllable and measurable parameters. With one or both of these parameters not within LCO limits, action must be taken to restore parameter(s).

RCS total flow rate is not a controllable parameter and is not expected to vary during steady state operation. If the indicated RCS total flow rate is below the LCO limit, power must be reduced, as required by Required Action B.1, to restore DNB margin and eliminate the potential for violation of the accident analysis bounds.

The 2 hour Completion Time for restoration of the parameters provides sufficient time to adjust unit parameters, to determine the cause for the off normal condition, and to restore the readings within limits, and is based on plant operating experience.

B.1

If Required Action A.1 is not met 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 2 within 6 hours. In MODE 2, the reduced power condition eliminates the potential for violation of the accident analysis bounds. The Completion Time of 6 hours is reasonable to reach the required unit conditions in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

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

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 3.4.1.2

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

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 3.4.1.3

~~The 12 hour Surveillance Frequency for RCS total flow rate is performed using the installed flow instrumentation. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify operation within safety analysis assumptions.~~

SR 3.4.1.4

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

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

This SR is modified by a Note that allows entry into MODE 1, without having performed the SR, and placement of the unit in the best condition for performing the SR. The Note states that the SR is not required to be performed until 7 days after ≥ 90% RTP. This exception is appropriate since the heat balance requires the unit to be at a minimum of 90% RTP to obtain the stated RCS flow accuracies. The Surveillance shall be performed within 7 days after reaching 90% RTP.

BASES

APPLICABILITY (continued)

The special test exception of LCO 3.1.8, "MODE 2 PHYSICS TESTS Exceptions," permits PHYSICS TESTS to be performed at ≤ 5% RTP with RCS loop average temperatures slightly lower than normally allowed so that fundamental nuclear characteristics of the core can be verified. In order for nuclear characteristics to be accurately measured, it may be necessary to operate outside the normal restrictions of this LCO. For example, to measure the MTC at beginning of cycle, it is necessary to allow RCS loop average temperatures to fall below $T_{no\ load}$, which may cause RCS loop average temperatures to fall below the temperature limit of this LCO.

ACTIONS

A.1

If the parameters that are outside the limit cannot be restored, 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 MODE 2 with k_{eff} < 1.0 within 30 minutes. Rapid reactor shutdown can be readily and practically achieved within a 30 minute period.

The Completion Time is reasonable, based on operating experience, to reach MODE 2 with k_{eff} < 1.0 in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1

RCS loop average temperature is required to be verified ≥ 550°F ~~once every 12 hours~~. ~~The SR to verify RCS loop average temperatures every 12 hours is frequent enough to prevent the inadvertent violation of the LCO and takes into account indications and alarms that are continuously available to the operator 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. UFSAR, Section 15.0.3.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

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

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.

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

This SR is modified by a Note that only requires this SR to be performed during system heatup, cooldown, and ISLH testing. This SR is not required during critical operations because the combination of LCO 3.4.2 establishing a lower bound and the Safety Limits establishing an upper bound will provide adequate controls to prevent a change in excess of 100°F prior to entry into the performance condition of heatup and cooldown operations.

REFERENCES

1. WCAP-14040, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," June 1994.
2. 10 CFR 50, Appendix G.
3. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
4. ASTM E 185-82, July 1982.
5. 10 CFR 50, Appendix H.
6. Regulatory Guide 1.99, Revision 2, May 1988.
7. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

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

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. UFSAR, Chapter 15.

BASES

ACTIONS (continued)

F.1, F.2, and F.3

If two required RCS loops are inoperable, action must be initiated to place the Rod Control System in a condition incapable of rod withdrawal (e.g., disable all CRDMs by opening the RTBs or de-energizing the MG sets). All operations involving a reduction of RCS boron concentration must be suspended, and action to restore one of the RCS loops to OPERABLE status must be initiated. Boron dilution requires forced circulation for proper mixing, and disabling the CRDMs removes the possibility of an inadvertent rod withdrawal. The immediate Completion Time reflects the importance of maintaining the capability for heat removal. The action to restore must be continued until one loop is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

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

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 3.4.5.2

SR 3.4.5.2 requires verification of required SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is ≥ 18% for each required RCS loop. If the SG secondary side narrow range water level is < 18%, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink for removal of the decay heat. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to a loss of SG level.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.5.3

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

REFERENCES UFSAR, Section 15.4.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

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

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 3.4.6.2

SR 3.4.6.2 requires verification of required SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is ≥ 18% for each required RCS loop. If the SG secondary side narrow range water level is < 18%, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.~~

SR 3.4.6.3

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

REFERENCES

None.

BASES

ACTIONS (continued)

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

If two required RHR loops are inoperable or the required RHR loop and one or both SG secondary side water levels are not within limit(s), all operations involving a reduction of RCS boron concentration must be suspended and action to restore one RHR loop to operation must be immediately initiated or initiate action to restore required SG secondary side water level to within limits. Boron dilution requires forced circulation to provide proper mixing and preserve the margin to criticality. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

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

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 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are ≥ 18% ensures an alternate decay heat removal method via natural circulation in the event that the second RHR loop is not OPERABLE. If both RHR loops are OPERABLE, this surveillance is not needed. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.3

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 that a second RHR pump is OPERABLE, when required, ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the RHR pump. If secondary side water level is ≥ 18% in at least two SGs, this surveillance is not needed. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~

REFERENCES

1. NRC Information Notice 95-35, "Degraded Ability of Steam Generators to Remove Decay Heat by Natural Circulation," August 28, 1995.

BASES

ACTIONS (continued)

C.1 and C.2

If no required RHR loops are OPERABLE, all operations involving a reduction of RCS boron concentration must be suspended and action must be initiated immediately to restore an RHR loop to OPERABLE status. Boron dilution requires forced circulation to provide proper mixing and preserve the margin to criticality. The immediate Completion Times reflect the importance of maintaining the capability for heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

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

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 3.4.8.2

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

REFERENCES

None.

BASES

ACTIONS (continued)

B.1

If the required groups of pressurizer heaters are inoperable, restoration is required within 72 hours. The Completion Time of 72 hours is reasonable considering the anticipation that a demand caused by loss of offsite power would be unlikely in this period. Pressure control may be maintained during this time using the remaining pressurizer heater capability.

C.1 and C.2

If Required Action B.1 and its associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 6 hours and to MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

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

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)

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 3.4.9.2

The SR is satisfied when the power supplies are demonstrated to be capable of producing the minimum power and the associated pressurizer heaters are verified to be ≥ 150 kW. This is performed by energizing the heaters and measuring circuit current. ~~The Frequency of 18 months is considered adequate to detect heater degradation and has been shown by operating experience to be acceptable.~~

SR 3.4.9.3

This Surveillance demonstrates that the heaters can be manually transferred from the normal non-ESF power supply to the ESF power supply and energized. ~~The Frequency of 18 months is based on a typical fuel cycle and is consistent with similar verifications of ESF power supplies.~~

REFERENCES

1. UFSAR, Chapter 15.

2. NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980.

3. Westinghouse Owners Group Study, "Emergency Power Supply Requirements for the Pressurizer Heaters," transmitted via B. L. King to C. Reed, TMI-OG-83, September 26, 1979.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

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

The Note modifies this SR by stating that it is not required to be met with the block valve closed in accordance with the Required Actions of this LCO. ~~If the block valve is closed to isolate an inoperable PORV that is incapable of being manually cycled, the maximum Completion Time to restore the PORV and open the block valve is 72 hours, which is well within the allowable limits (25%) to extend the block valve Frequency of 92 days. Furthermore, these~~ These test requirements would be completed by the reopening of a recently closed block valve upon restoration of the PORV to OPERABLE status (i.e., completion of the Required Actions fulfills the SR).

SR 3.4.11.2

SR 3.4.11.2 requires a complete cycle of each PORV. Operating a PORV through one complete cycle ensures that the PORV can be manually actuated for mitigation of an SGTR. ~~The Frequency of 18 months is based on a typical refueling cycle and industry accepted practice.~~

The Note modifies the SR to allow entry into and operation in MODE 3 prior to performing the SR. This allows the test to be performed in MODE 3 under operating temperature and pressure conditions prior to entering MODE 1 or 2. In accordance with Reference ~~4~~ 3, this test should be performed in MODE 3 or 4 to adequately simulate operating temperature and pressure effects on PORV operation.

SR 3.4.11.3

Operating the solenoid air control valves and check valves on the air accumulators ensures the PORV control system actuates properly when called upon. ~~The Frequency of 18 months is based on a typical refueling cycle and the Frequency of the other Surveillances used to demonstrate PORV OPERABILITY.~~

BASES

REFERENCES

1. Regulatory Guide 1.32, February 1977.

2. UFSAR, Section 15.2.

3. ~~ASME Code for Operation and Maintenance of Nuclear Power Plants.~~

~~4.~~ Generic Letter 90-06, "Resolution of Generic Issue 70, "Power Operated Relief Valve and Block Valve Reliability," and Generic Issue 94, "Additional Low Temperature Overpressure Protection for Light Water Reactors," pursuant to 10 CFR 50.54(f), June 25, 1990.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, all SI pumps and all charging pumps but one centrifugal charging pump are verified incapable of injecting into the RCS, and the accumulator discharge isolation valves are verified closed and de-energized.

The SI pumps and charging pumps are rendered incapable of injecting into the RCS through removing the power from the pumps by racking the breakers out under administrative control. An alternate method of LTOP control may be employed using at least two independent means to prevent a mass addition event such that a single failure or single action will not result in an injection into the RCS. This may be accomplished through the pump control switch being placed in pull to lock and at least one valve in the discharge flow path being closed. This latter method is appropriate when the SI pump needs to be available for mitigation of the effects of a loss of decay heat removal event (Ref. 6). Another alternate method of LTOP control may be utilized when a pump must be energized for testing or for filling accumulators to assure positive control of the capability for injection by the pump. This may be accomplished by closing the isolation valve and removing power from the valve operator, or by securing a manual isolation valve in the closed position. These methods are acceptable provided that an OPERABLE flow path exists from the RWST to the RCS.

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

SR 3.4.12.3 is modified by a Note stating that accumulator isolation is only required to be met for an accumulator if its pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.12.4

The RCS vent of ≥ 2.0 square inches is proven OPERABLE by verifying its open condition ~~either:~~

~~a. Once every 12 hours for a valve that cannot be locked.~~

~~b. Once every 31 days for a valve that is locked, sealed, or secured in position. A removed pressurizer safety valve fits this category~~.

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 passive vent arrangement must only be open to be OPERABLE. This Surveillance is required to be performed if the vent is being used to satisfy the pressure relief requirements of LCO 3.4.12.d.4.

SR 3.4.12.5

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction isolation valves are open. This Surveillance is only required to be performed if the RHR suction relief valve is being used to satisfy this LCO.

The RHR suction isolation valves, RH8701A and RH8701B for relief valve RH8708A, and RH8702A and RH8702B for relief valve RH8708B, are verified to be opened ~~every 72 hours~~. 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 is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RHR suction valves remain open.~~

The ASME Code (Ref. 7) test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.12.6

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

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

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

SR 3.4.12.7

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.

Performance of a COT is required within 12 hours after decreasing RCS temperature to ≤ 350°F and ~~every 31 days~~ periodically on each required PORV to verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within the allowed maximum limits in the PTLR. PORV actuation could depressurize the RCS and is not required.

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

A Note indicates that this SR is not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ 350°F.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.12.8

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

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 G.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. UFSAR, Chapter 15.
5. Generic Letter 90-06.
6. Safety Evaluation Report, dated August 31, 1990.
7. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1

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

The RCS water inventory balance must be performed with the reactor at steady state operating conditions and near operating pressure. The Surveillance is modified by two Notes. Note 1 states that this SR is not required to be performed until 12 hours after establishing steady state operation. The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Steady state operation is required to perform a proper inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure (≥ 2150 psig), temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

An early warning of pressure boundary LEAKAGE or unidentified LEAKAGE is provided by the systems that monitor the containment atmosphere radioactivity and the containment sump level. It should be noted that LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE. These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

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

The 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 72 hour Frequency during steady state operation is a reasonable interval to trend LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less than or equal to 150 gallons per day through any one SG. Satisfying the primary to Secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, compliance with LCO 3.4.19, "Steam Generator Tube Integrity," should be evaluated. The 150 gallons per day limit is measured at room temperature as described in Reference 5. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

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

The 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 of 72 hours is a reasonable interval to trend primary to secondary LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents.~~ The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with EPRI guidelines (Ref. 6).

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. Regulatory Guide 1.45, May 1973.
3. UFSAR, Chapter 15.
4. 10 CFR 50.67.
5. NEI 97-06, "Steam Generator Program Guidelines."
6. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."

BASES

ACTIONS (continued)

C.1 and C.2

If the Required Actions and associated Completion Times of Conditions A and B are not met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. This Action may reduce the leakage and also reduces the potential for a LOCA outside the containment. The allowed Completion Times are reasonable based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

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

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

but may be extended

9

Testing is to be performed every ~~18~~ months, ~~a typical refueling cycle~~, if the plant does not go into MODE 5 for at least 7 days. ~~The 18 month Frequency is consistent with 10 CFR 50.55a(g) (Ref. 8) as contained in the Inservice Testing Program, is within the frequency allowed by the American Society of Mechanical Engineers (ASME) Code (Ref. 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.

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 3.4.14.2

The interlock setpoint that prevents the RHR System suction isolation valves from being opened is set so the actual RCS pressure must be < 360 psig to open the valves. This setpoint ensures the RHR design pressure will not be exceeded and the RHR relief valves will not lift. ~~The 18 month Frequency is based on the need to perform the Surveillance under conditions that apply during a unit outage. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.~~

REFERENCES

1. 10 CFR 50.2.
2. 10 CFR 50.55a(c).
3. 10 CFR 50, Appendix A, Section V, GDC 55.
4. WASH-1400 (NUREG-75/014), Appendix V, October 1975.
5. NUREG-0677, May 1980.
6. EG&G Report, EGG-NTAP-6175.
7. ASME Code for Operation and Maintenance of Nuclear Power Plants.
8. ~~10 CFR 50.55a(g).~~

BASES

ACTIONS (continued)

C.1 and C.2

If a Required Action and associated Completion Time of Condition A or B is not met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1

With all required monitors inoperable, no means of monitoring leakage are available, and immediate actions, in accordance with LCO 3.0.3, are required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the containment atmosphere particulate radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. ~~The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.~~

The 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 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the containment atmosphere particulate radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test consists of exercising the digital computer hardware using data base manipulation and injecting simulated process data to verify OPERABILITY of alarm and trip functions. The test verifies the alarm setpoint and relative accuracy of the instrument string. ~~The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation.~~

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 3.4.15.3 and SR 3.4.15.4

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

REFERENCES

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

2. Regulatory Guide 1.45.

3. UFSAR, Section 5.2.5.

4. Safety Evaluation Regarding Leak-Before-Break Analysis - Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, dated October 25, 1996.

BASES

ACTIONS (continued)

B.1

If the Required Action and associated Completion Time of Condition A is not met or if the DOSE EQUIVALENT I-131 specific activity is in the unacceptable region of Figure 3.4.16-1, the reactor must be brought to MODE 3 with RCS average temperature < 500°F within 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 below 500°F from full power conditions in an orderly manner and without challenging plant systems.

C.1

With the gross specific activity in excess of the allowed limit, the unit must be placed in MODE 3 with RCS average temperature < 500°F. This action lowers the saturation pressure of the reactor coolant below the setpoints of the main steam safety valves and prevents venting the SG to the environment in an SGTR, Control Rod Ejection or Locked Rotor event. MSLB releases are similarly limited with the exception of initial blowdown and leakage through the affected SG. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 below 500°F from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the gross specific activity of the reactor coolant ~~at least once every 7 days~~. A gross radioactivity analysis consists of the quantitative measurement of the total specific activity of the reactor coolant except for radionuclides with half lives < 10 minutes and all radioiodines. The total specific activity is the sum of the degassed beta-gamma activity and the total of all identified gaseous activities in the sample within 2 hours after the sample was taken. Determination of the contributors to the gross specific activity are based upon those energy peaks identifiable with a 95% confidence level. The latest available data may be used for pure beta emitting radionuclides. This Surveillance provides an indication of any increase in gross specific activity.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The Surveillance is applicable in MODES 1 and 2, and in MODE 3 with RCS average temperature ≥ 500°F. ~~The 7 day Frequency considers the unlikelihood of a gross fuel failure during the time.~~

SR 3.4.16.2

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

SR 3.4.16.3

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.

A radiochemical analysis for $\bar{E}$ determination is required ~~every 184 days (6 months)~~ with the unit operating in MODE 1 equilibrium conditions. The $\bar{E}$ determination directly relates to the LCO and is required to verify unit operation within the specified gross activity LCO limit. The analysis for $\bar{E}$ is a measurement of the average energies per disintegration for isotopes with half lives longer than 10 minutes, excluding iodines. ~~The Frequency of 184 days recognizes $\bar{E}$ does not change rapidly.~~

This SR has been modified by a Note that indicates sampling is required to be performed within 31 days after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for at least 48 hours. This ensures that the radioactive materials are at equilibrium so the analysis for $\bar{E}$ is representative and not skewed by a crud burst or other similar abnormal event.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.17.1

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 Surveillance is performed ~~at least once per 31 days~~ to ensure that the RCS loop isolation valves are open, with power removed from the loop isolation valve operators. The primary function of this Surveillance is to ensure that power is removed from the valve operators, since SR 3.4.4.1 of LCO 3.4.4, "RCS Loops-MODES 1 and 2," ensures that the loop isolation valves are open by verifying ~~every 12 hours~~ that all loops are operating and circulating reactor coolant. ~~The Frequency of 31 days ensures that the required flow can be made available, is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 31 day Frequency is justified.~~

REFERENCES

1. UFSAR, Section 15.4.4.

BASES

ACTIONS (continued)

C.1 and C.2

If the accumulator cannot be returned 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 MODE 3 within 6 hours and RCS pressure reduced to ≤ 1000 psig within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1

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

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 3.5.1.1

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

SR 3.5.1.2 and SR 3.5.1.3

Borated

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator ~~every 31 days~~ since the static design of the accumulators limits the ways in which the concentration can be changed. ~~The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage.~~

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 3.5.1.5

Sampling the affected accumulator within 6 hours after a 1% volume increase (nominally 70 gallons or 10% of indicated level) will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration of the accumulator after a 1% volume increase (10% indicated level increase) if the added water inventory is from the Refueling Water Storage Tank (RWST) and the boron concentration of the RWST is ≥ 2200 ppm and ≤ 2400 ppm. With the water contained in the RWST within the boron concentration requirements of the accumulators, any added inventory would not cause the accumulator's boron concentration to exceed the limits of this LCO.

With the only indication available to the operators in the control room being level indication in percent, a required accumulator volume increase of 1% or an increase of 10% of indicated level would require the accumulator to be sampled to verify the accumulator boron concentration is within the limits. The small break LOCA analysis assumes a nominal water volume of 7106 gallons based on the TS minimum and maximum limits of 6995 gallons (935 ft^3, 31% of indicated level) and 7217 gallons (965 ft^3, 63% of indicated level). These volumes are also indicated in the specific tank curves for the SI accumulators. The large break LOCA analysis assumes a water volume range of 6882 gallons (920 ft^3, 15% of indicated level) to 7331 gallons (980 ft^3, 79% of indicated level) which bounds the TS limits. The 10% indicated level increase is considered a conservative indication for a 70 gallon increase in the accumulator volume requiring an increase in the sampling requirement to verify accumulator boron concentration remains within the specified limits.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.6

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

The power to the accumulator motor operated isolation valves is removed by opening the motor control center breaker and tagging it out administratively. ~~Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that power is removed.~~

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. IEEE Standard 279-1971.
2. UFSAR, Chapter 15.
3. UFSAR, Chapter 6.
4. 10 CFR 50.46.

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 3.5.2.1

Verification of proper motor operated valve position ensures that the injection flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable. Securing these valves in position by removal of power ensures that they cannot change position as a result of an active failure or be inadvertently misaligned. These valves are of the type, described in Reference 8, that can disable the function of both ECCS trains and invalidate the accident analyses. ~~A 12 hour Frequency is considered reasonable in view of other administrative controls that will ensure a mispositioned valve is unlikely.~~

SR 3.5.2.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position (e.g., the valves listed in SR 3.5.2.1 and SR 3.5.2.7), since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This Surveillance does not require any testing or valve manipulation. Rather, it involves verification that those valves capable of being mispositioned are in the correct position. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control, and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.3

With the exception of the operating centrifugal charging pump, the ECCS pumps are normally in a standby, nonoperating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. The system will perform properly, injecting its full capacity into the RCS upon demand, by maintaining the piping from the ECCS pumps to the RCS full of water. This will also prevent water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SI signal or during shutdown cooling. As described in Reference 9, voided lines are prevented by proper vent location and filling and venting procedures. Therefore, verification that the ECCS piping is maintained full of water is accomplished by venting certain portions of the ECCS and by performing ultrasonic examinations of other portions of the ECCS lacking vents. ~~The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.~~ 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 ECCS piping is maintained full of water by venting the non-operating ECCS pump casings and the discharge piping high points (applicable to idle RH and SI systems only) outside containment. This venting surveillance does not apply to subsystems in communication with operating systems because the flows in these systems are sufficient to provide confidence that water hammer which could occur from voiding would not result in unacceptable dynamic loads. During shutdown cooling operation, the exclusion would apply to the operating RH pump, in addition to the ECCS piping in communication with the operating pump.

For selected portions of piping (i.e., portions involving the idle CV pump discharge piping up to the first check valve on the pump discharge and miniflow lines, the stagnant portion of the piping upstream of the SI8801A/B adjacent to the vent valve SI045, and the piping at the 1CV207 or 2CV206 valve if the B CV pump is idle) the verification that the piping is filled with water will be performed by ultrasonic examination. This examination will provide added assurance that the piping is maintained water solid. These methods are consistent with Reference 10.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. SRs are specified in the Inservice Testing Program of the ASME Code. The ASME Code provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.5

This Surveillance demonstrates that each automatic ECCS valve actuates to the required position on an actual or simulated SI signal (a coincident RWST Level Low-Low signal is required to open the containment sump isolation valves). This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This Surveillance may be performed on-line ~~at an 18 month Frequency~~ during RH system maintenance work windows when the RH pump suction piping is drained; thus, reducing overall RH system unavailability. If there is not an on-line RH system maintenance work window that requires the RH pump suction piping to be drained, this Surveillance must be conducted during refueling outages (Ref. 11). ~~The 18 month Frequency is acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.~~ 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 actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the Inservice Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.6

This Surveillance demonstrates that each ECCS pump starts on receipt of an actual or simulated SI signal. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned unit transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.~~ The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the Inservice Testing Program.

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 3.5.2.7

Realignment of valves in the flow path on an SI signal is necessary for proper ECCS performance. These valves have mechanical stops to allow proper positioning for restricted flow to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. ~~The 18 month Frequency is based on the same reasons as those stated in SR 3.5.2.5 and SR 3.5.2.6.~~

SR 3.5.2.8

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

BASES

ACTIONS (continued)

B.1

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

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

C.1 and C.2

If the RWST cannot be returned to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.4.2

Heat traced portions of the RWST vent path should be verified ~~every 24 hours~~ to be within the temperature limit needed to prevent ice blockage and subsequent vacuum formation in the tank during rapid level decreases caused by accident conditions. ~~This Frequency is sufficient to identify a temperature change that would approach the lower limit and has been shown to be acceptable through 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.

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when the ambient air temperature is ≥ 35°F. With ambient air temperature above this limit, the RWST vent path will be free of ice blockage.

SR 3.5.4.3

The RWST water volume should be verified ~~every 7 days~~ to be above the required minimum level of 89% (useable volume of > 395,000 gallons) in order to ensure that a sufficient initial supply is available for injection and to support continued ECCS and Containment Spray System pump operation on recirculation. ~~Since the RWST volume is normally stable and protected by a low level alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.~~

SR 3.5.4.4

The boron concentration of the RWST should be verified ~~every 7 days~~ to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA and will limit the power level increase and subsequently returns the reactor to subcritical immediately following an MSLB. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur, sufficient iodine will be retained to limit doses, stress corrosion cracking of equipment will be minimized, and hydrogen production will be minimized. ~~Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

Verification ~~every 31 days~~ that the manual seal injection throttle valves are adjusted to give a flow within the limit ensures that proper manual seal injection throttle valve position, and hence, proper seal injection flow, is maintained. To verify acceptable seal injection flow, the following is performed; differential pressure between the charging header (PT-120) and the RCS is determined and the seal injection flow is verified to be within the limits of Figure 3.5.5-1. ~~The Frequency of 31 days is based on engineering judgment and is consistent with other ECCS valve Surveillance Frequencies. The Frequency has proven to be acceptable through operating experience.~~

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

REFERENCES

1. UFSAR, Chapter 6 and Chapter 15.

2. 10 CFR 50.46.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.2.2

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 is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. ~~Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the containment air lock door is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed every 24 months. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of containment OPERABILITY if the Surveillance were performed with the reactor at power. The 24 month Frequency for the interlock is justified based on generic operating experience. The 24 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during use of the air lock.~~

REFERENCES

1. 10 CFR 50, Appendix J, Option B.
2. UFSAR, Section 6.2.
3. 10 CFR 50.67.

BASES

ACTIONS (continued)

E.1 and E.2

If the Required Actions and associated Completion Times are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Each 48 inch containment purge valve is required to be verified sealed closed ~~at 31 day intervals~~. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a containment purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A containment purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by installing a mechanical block. In this application, the term "sealed" has no connotation of leak tightness. ~~The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.3.~~

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.2

This SR ensures that the minipurge valves are closed as required or, if open, open for an allowable reason under administrative control. If a purge valve is open in violation of this SR, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The SR is not required to be met when the minipurge valves are open under administrative control. The valves may be opened for example; for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The minipurge 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 containment isolation valve requirements discussed in SR 3.6.3.3.~~

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.3

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

The Note applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3, and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

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 3.6.3.6 and SR 3.6.3.7

For containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option B, is required to ensure OPERABILITY. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. ~~Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established for the 48 inch purge valves as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 4).~~

~~The 92 day Frequency was chosen for the 8 inch purge valves recognizing that cycling the valve could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure since the 8 inch purge valves may be opened periodically during the 92 day interval.~~

SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass this Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

BASES

REFERENCES

1. UFSAR, Section 6.2.

2. Regulatory Guide 1.183, July 2000.

3. Standard Review Plan 6.2.4.

~~4. Generic Issue B-20, "Containment Leakage Due to Seal Deterioration."~~

BASES

ACTIONS (continued)

B.1 and B.2

If containment pressure cannot be restored to within limits within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1

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 that containment pressure is within limits ensures that unit operation remains within the limits assumed in the containment analysis. ~~The 12 hour Frequency of this SR was developed based on operating experience related to trending of containment pressure variations during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment pressure condition.~~

REFERENCES

1. UFSAR, Section 6.2.
2. Safety Evaluation Report Related to the Operation of Byron Station Units 1 and 2, Supplement 2.
3. 10 CFR 50, Appendix K.

BASES

ACTIONS (continued)

B.1 and B.2

If the containment average air temperature cannot be restored to within its limit within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying that containment average air temperature is within the LCO limit ensures that containment operation remains within the limit assumed for the containment analyses. In order to determine the containment average air temperature, an arithmetic average is calculated using measurements taken at locations within the containment selected to provide a conservative estimate of the overall containment atmosphere (e.g., the dry bulb inlet temperature of the running reactor containment fan coolers). ~~The 24 hour Frequency of this SR is considered acceptable based on observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to an abnormal containment 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.

REFERENCES

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

BASES

ACTIONS (continued)

D.1 and D.2

If the Required Action and associated Completion Time of Condition C of this LCO are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

E.1

With two containment spray trains or any combination of three or more containment spray and cooling trains inoperable, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1

Verifying the correct alignment for manual, power operated, and automatic valves in the containment spray flow path provides assurance that the proper flow paths will exist for Containment Spray System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment (only check valves are inside containment) and capable of potentially being mispositioned are in the correct 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.2

Operating each containment cooling train fan unit (in slow speed) for ≥ 15 minutes ensures that all trains 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. ~~The 31 day Frequency was developed considering the known reliability of the fan units and controls, the two train redundancy available, and the low probability of significant degradation of the containment cooling train occurring between surveillances. It has also been shown to be acceptable through 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.

SR 3.6.6.3

This SR requires verifying that an SX flow rate greater than or equal to the design flow rate assumed in the safety analyses (i.e., 2660 gpm) to each containment cooling unit (RCFC) will be achieved with the primary containment refrigeration units in their specified safety configuration described in UFSAR Section 9.4.8 (Ref.2). ~~The Frequency was developed considering the known reliability of the SX System, the two train redundancy available, and the low probability of a significant degradation of flow occurring between surveillances.~~

SR 3.6.6.4

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by the ASME Code (Ref. 8). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by abnormal performance. The Frequency of the SR is in accordance with the Inservice Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification that each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated actuation of a containment High-3 pressure signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

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 of containment sump isolation valves is also required by SR 3.5.2.5. A single surveillance may be used to satisfy both requirements.

SR 3.6.6.7

This SR requires verification that each containment cooling train actuates upon receipt of an actual or simulated safety injection signal. ~~The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. See SR 3.6.6.5 and SR 3.6.6.6, above, for further discussion of the basis for the 18 month Frequency.~~

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 3.6.6.8

With the containment spray inlet valves closed and the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test following maintenance that could result in nozzle blockage or following fluid flow through the nozzles is considered adequate to detect obstruction of the nozzles.

BASES

ACTIONS (continued)

B.1 and B.2

If the Spray Additive System cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows additional time for attempting restoration of the Spray Additive System and is reasonable when considering the driving force for a release of radioiodine from the Reactor Coolant System is reduced in MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1

Verifying the correct alignment of Spray Additive System manual and automatic valves in the spray additive flow path provides assurance that the system is able to provide additive to the Containment Spray System in the event of a DBA. 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. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.7.2

To provide effective iodine retention in the containment sump, the containment spray must be an alkaline solution. Since the RWST contents are normally acidic, the volume of the spray additive tank must provide a sufficient volume of spray additive to adjust pH for all water injected. This SR is performed to verify the availability of sufficient NaOH solution in the Spray Additive System. ~~The 184 day Frequency was developed based on the low probability of an undetected change in tank volume occurring during the SR interval (the tank is isolated during normal unit operations). Tank level is also indicated and alarmed in the control room, so that there is high confidence that a substantial change in level would be detected.~~

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 3.6.7.3

This SR provides verification of the NaOH concentration in the spray additive tank and is sufficient to ensure that the spray solution being injected into containment is at the correct pH level. ~~The 184 day Frequency is sufficient to ensure that the concentration level of NaOH in the spray additive tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.~~

SR 3.6.7.4

This SR provides verification that each automatic valve in the Spray Additive System flow path actuates to its correct position. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.7.5

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.

To ensure that the correct pH level is established in the borated water solution provided by the Containment Spray System, the flow rate in the Spray Additive System is verified ~~once every 5 years~~. This SR provides assurance that the correct amount of NaOH will be metered into the flow path in each CS train upon Containment Spray System initiation. ~~Due to the passive nature of the spray additive flow controls, the 5 year Frequency is sufficient to identify component degradation that may affect flow rate.~~

REFERENCES

1. UFSAR, Section 6.5.2.
2. UFSAR, Chapter 15.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that MSIV closure time is ≤ 5 seconds. The MSIV closure time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. Based on ASME Code (Ref. 5), the MSIVs are not closure time tested at power.

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

SR 3.7.2.2

This SR verifies that each MSIV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. ~~The frequency of MSIV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.~~

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. This Note allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

REFERENCES

1. UFSAR, Section 10.3.

2. UFSAR, Section 15.1.5.

3. UFSAR, Section 6.2.

4. 10 CFR 50.67.

5. ASME Code for Operation and Maintenance of Nuclear Power.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the secondary specific activity is within the limits of the accident analysis. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the validity of the safety analysis assumptions as to the source terms in post accident releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. ~~The 31 day Frequency is based on the detection of increasing trends of the level of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.~~

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 50.67.
2. UFSAR, Chapter 15.

BASES

ACTIONS (continued)

C.1 and C.2

If the SG PORV lines cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

To perform a controlled cooldown of the RCS, the SG PORVs must be able to be opened either remotely or locally and throttled through their full range. This SR ensures that the SG PORVs are tested through a full control cycle at least once per fuel cycle. Performance of inservice testing or use of a SG PORV during a unit cooldown may satisfy this requirement. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. 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 3.7.4.2

The function of the block valve is to isolate a failed open SG PORV. Cycling the block valve both closed and open demonstrates its capability to perform this function. Performance of inservice testing or use of the block valve during unit cooldown may satisfy this requirement. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. 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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AF System provides assurance that the proper flow paths will exist for AF operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

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

SR 3.7.5.2

This SR provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is added. The level is expressed as an equivalent volume in gallons.

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

SR 3.7.5.3

This SR verifies that each diesel driven AF pump is run for greater than or equal to 15 minutes.

~~The 31 day Frequency is based on operating experience and the low probability of significant degradation of the AF diesel prime mover occurring between performances of the surveillance.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.4

Verifying that each AF pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AF pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by the ASME Code (Ref. 4). Because it is undesirable to introduce cold AF into the steam generators while they are operating, this testing is performed on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code (Ref. 4) (only required at 3 month intervals) satisfies this requirement.

SR 3.7.5.5

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 AF can be delivered to the steam generators in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~ ~~The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.~~

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 3.7.5.6

This SR verifies that the AF pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AF pump starts automatically on an actual or simulated actuation signal. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

SR 3.7.5.7

This SR verifies that the AF is properly aligned by verifying the flow paths from the CST to each steam generator prior to entering MODE 2 after more than 30 days in any combination of MODE 5, MODE 6, or defueled. OPERABILITY of AF flow paths must be verified before sufficient core heat is generated that would require the operation of the AF System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To ensure AF System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the CST to the steam generators is properly aligned.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

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

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. Branch Technical Position RSB 5-1, "Design Requirements of the Residual Heat Removal System."
2. NRC Safety Evaluation, "Natural Circulation Cooldown, Byron Units 1 and 2 and Braidwood Units 1 and 2," dated November 4, 1988.
3. UFSAR, Section 9.2.6.
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. UFSAR, Section 10.4.9.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

Verifying the correct alignment for manual and power operated valves in the CC flow path provides assurance that the proper flow paths exist for CC operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

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

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 indicating isolation of the CC flow to individual components does not affect the OPERABILITY of the CC System. Isolation may render those components inoperable.

SR 3.7.7.2

This SR verifies the correct alignment for manual and power operated SX valves directly serving the CC heat exchangers that are not locked, sealed, or otherwise in the correct position, are in the correct position or can be aligned to the correct position. This includes the ability to align the SX system as required to support unit-specific or opposite unit operations. It also includes assuring that the requirements of the ISI and IST programs are satisfied. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

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

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 3.7.7.3

This SR verifies proper automatic operation of the CC pumps on an actual or simulated actuation signal. The CC System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

REFERENCES

1. UFSAR, Section 9.2.2.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the unit-specific SX flow path provides assurance that the proper flow paths exist for unit-specific SX operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

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

This SR is modified by a Note indicating isolation of the SX components does not affect the OPERABILITY of the SX System. Isolation of components may render those components inoperable.

SR 3.7.8.2

This SR verifies that the opposite-unit SX pump can be run for ≥ 15 minutes. This SR does not require the opposite-unit pump to supply SX to the specific unit. SR 3.7.8.2 is modified by a note that only requires this surveillance to be performed when the opposite unit is in MODE 5 or 6 or has no fuel in the reactor vessel. If the opposite unit is in MODE 1, 2, 3, or 4, its SX System is normally operating. If the opposite unit is shut down, the credited SX pump may not be operating. Therefore, the Note requires the surveillance to be performed. ~~The 31 day Frequency is based on engineering judgment, considering the activities of the opposite unit and knowledge of plant status available to the control room operators.~~

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 3.7.8.3

This SR verifies proper operation of the opposite-unit SX crosstie valves (1SX005 and 2SX005). This Surveillance is not required if the opposite-unit SX crosstie valve is secured in the open position with power removed. ~~The 92 day frequency is based on the inservice testing requirements for these valves.~~

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

SR 3.7.8.4

This SR verifies proper automatic operation of the unit-specific SX System valves on an actual or simulated actuation signal. The SX System is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

SR 3.7.8.5

This SR verifies proper automatic operation of the unit-specific SX pumps on an actual or simulated actuation signal. The SX System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

BASES

ACTIONS

A.1 and A.2

If the UHS is inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the SX pumps. ~~The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.~~ This SR verifies that the UHS water level is ≥ 590 ft mean sea level United States Geological Society datum.

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 3.7.9.2

This SR verifies that the SX System is available to cool the CC System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. ~~The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.~~ This SR verifies that the average water temperature of the UHS is ≤ 100°F, as measured at the discharge of an SX pump.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.9.3

This surveillance verifies that the UHS contains adequate storage volume to supply the required design basis inventory to support the function of the essential service water system. SR 3.7.9.1 verifies the contained volume of the UHS, while this SR verifies that the UHS, if filled to the depth required by SR 3.7.9.1, can supply the water required to support the safety function of 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.

SR 3.7.9.3 assures that the bottom elevation of the UHS is less than or equal to 584 ft Mean Sea Level (MSL). This surveillance is performed by means of a hydrographic survey~~,~~ ~~once every 18 months~~. ~~The frequency is based on engineering judgement and the likelihood that any geologic or natural event that significantly altered the bottom elevation of the UHS in a shorter period would be identified by other means.~~

REFERENCES

1. UFSAR, Section 9.2.5.
2. Regulatory Guide 1.27.

BASES

ACTIONS (continued)

F.1

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

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. ~~As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. Monthly heater~~ Heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. The makeup air filter unit includes heaters. Therefore, the subsystem must be initiated from the control room and operated for ≥ 10 continuous hours with the heaters energized. The recirculation subsystem filters do not contain heaters and need only be operated for ≥ 15 minutes to demonstrate the function of the system. For purposes of satisfying this SR, the recirculation subsystem may be run concurrently with the makeup subsystem. ~~The 31 day Frequency is based on the reliability of the equipment and the two train redundancy.~~ 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 3.7.10.2

This SR verifies that the required VC Filtration System testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VC Filtration System filter tests are in general conformance with Regulatory Guide 1.52 (Ref. 5). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, system flow rates, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP. The acceptance criteria stated in the VFTP, ensure that the filter efficiencies assumed in the safety analyses are met.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.3

This SR verifies that each VC Filtration System train aligns, starts, and operates on an actual or simulated actuation signal. ~~The Frequency of 18 months is based on industry operating experience and is consistent with the typical refueling cycle.~~

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 3.7.10.4

This SR verifies the OPERABILTY of the CRE boundary by testing for unfiltered air inleakage past the CRE boundary and into the CRE. The details of the testing are specified in the Control Room Envelope Habitability Program.

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the CRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the CRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 9) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 6). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 8). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the CRE boundary has been restored to OPERABLE status.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR monitors the control room temperature for indication of VC Temperature Control System performance. Trending of control room temperature will provide a qualitative assessment of VC Temperature Control System chiller OPERABILITY. ~~The 12 hour Frequency is adequate considering the continuous manning of the control room by the operating staff.~~

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 3.7.11.2

This SR verifies that the heat removal capability of the system is sufficient to remove the required heat load. This SR consists of a combination of testing and calculations. ~~The 18 month Frequency is appropriate since significant degradation of the VC Temperature Control System is slow and is not expected over this time period.~~

REFERENCES

None.

BASES

ACTIONS (continued)

B.1 and B.2

If the Nonaccessible Area Exhaust Filter Plenum Ventilation System train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. ~~As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system.~~ System ~~Monthly system~~ operation for ≥ 15 minutes demonstrates the function of the system. ~~The 31 day Frequency is based on the known reliability of equipment and the redundancy available.~~

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 3.7.12.2

This SR verifies that the required Nonaccessible Area Exhaust Filter Plenum Ventilation System testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The Nonaccessible Area Exhaust Filter Plenum Ventilation System filter tests are in general conformance with Reference 6. The VFTP includes testing HEPA filter performance, charcoal adsorbers efficiency, system flow rates, and the physical properties of the activated charcoal (general use and following specific operations). Specific test Frequencies and additional information are discussed in detail in the VFTP. The acceptance criteria stated in the VFTP ensure that the filter efficiencies assumed in the safety analyses are met.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.3

This SR verifies that each Nonaccessible Area Exhaust Filter Plenum Ventilation System train aligns, starts, and operates on a manual, an actual, or a simulated actuation signal. ~~The 18 month Frequency is consistent with that specified in Reference 6.~~

SR 3.7.12.4

This SR verifies the integrity of the ECCS pump room areas. The ability of the ECCS pump room areas to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper functioning of the Nonaccessible Area Exhaust Filter Plenum Ventilation System. During the emergency mode of operation, the Nonaccessible Area Exhaust Filter Plenum Ventilation System is designed to maintain a slight negative pressure in the ECCS pump rooms, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The Nonaccessible Area Exhaust Filter Plenum Ventilation System is designed to maintain a ≤ -0.25 inches water gauge relative to atmospheric pressure with two trains operating, each at a flow rate ≤ 73,590 cubic feet per minute (cfm). This SR should be performed in four-fan operation with two auxiliary building normal supply and two auxiliary building normal exhaust fans in operation. Performance of the SR in this manner produces the least negative pressure in the ECCS pump room areas (i.e., the least margin to ≤ -0.25 inches water gauge). ~~The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 7).~~

~~The testing of two of the three trains on an 18 month Frequency on a STAGGERED TEST BASIS, requires that the combination of trains be varied, such that all possible combinations of trains be tested over a 54 month 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

If a particular pump room is isolated such that there is no potential for post accident fluids to pass through the room, or that room's ECCS equipment is not required, that room can be excluded from meeting the acceptance criteria of the SR. Performance of this SR with a room excluded, represents a change in the ECCS pump room area volume that the system is maintaining at a negative pressure. Prior to the room being put back in service, this SR would have to be performed with the new volume, to assure that the system can maintain the entire volume at the required negative pressure.

~~The 18 month Frequency on a STAGGERED TEST BASIS is consistent with that specified in Reference 6.~~

REFERENCES

1. UFSAR, Section 6.5.1.
2. UFSAR, Section 9.4.5.
3. UFSAR, Section 15.6.5.
4. 10 CFR 50.67.
5. UFSAR, Section 6.4.
6. Regulatory Guide 1.52 (Rev. 2).
7. ~~NUREG-0800, Section 6.5.1, Rev. 2, July 1981.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

Standby systems should be checked periodically to ensure that they function properly. ~~As the environmental and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.~~ System

~~Monthly system~~ operation for ≥ 15 minutes demonstrates the function of the system. ~~The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.~~

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 3.7.13.2

This SR verifies that the required FHB Ventilation System testing is performed in general conformance with the Ventilation Filter Testing Program (VFTP). The FHB Ventilation System filter tests are in general conformance with Regulatory Guide 1.52 (Ref. 6). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, system flow rates, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP. The acceptance criteria stated in the VFTP ensure that the filter efficiencies assumed in the safety analyses are met.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.3

This SR verifies the integrity of the fuel handling building and containment enclosure. The ability of the fuel handling building and containment to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the FHB Ventilation System and enclosure integrity. During the emergency mode of operation the FHB Ventilation System is designed to maintain a slight negative pressure in the fuel handling building to prevent unfiltered leakage. The FHB Ventilation System is designed to maintain a ≤ -0.25 inches water gauge with respect to atmospheric pressure. ~~The Frequency of 7 days on a STAGGERED TEST BASIS, is based on the increased containment activity that occurs when the equipment hatch is not intact, that could affect containment 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.

This SR is modified by a Note that requires this SR only during movement of RECENTLY IRRADIATED FUEL assemblies (in the fuel building or in the containment) when the equipment hatch is not intact.

SR 3.7.13.4

This SR verifies that each FHB Ventilation System train aligns, starts, and operates on an actual or simulated actuation signal. ~~The 18 month Frequency is consistent with Reference 6.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.5

This SR verifies the integrity of the fuel handling building enclosure. The ability of the fuel handling building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the FHB Ventilation System. During the emergency mode of operation the FHB Ventilation System is designed to maintain a slight negative pressure in the fuel handling building, to prevent unfiltered leakage. The FHB Ventilation System is designed to maintain a $\leq$ -0.25 inches water gauge with respect to atmospheric pressure at a flow rate $\leq$ 23,100 cfm to the fuel handling building. ~~The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 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.

~~An 18 month Frequency (on a STAGGERED TEST BASIS) is consistent with Reference 6.~~

This SR is modified by a Note that requires this SR only during movement of RECENTLY IRRADIATED FUEL assemblies in the fuel handling building when the equipment hatch is intact.

REFERENCES

1. UFSAR, Section 6.5.1.

2. UFSAR, Section 9.4.5.

3. UFSAR, Section 15.7.4.

4. Regulatory Guide 1.183, July 2000.

5. 10 CFR 50.67.

6. Regulatory Guide 1.52 (Rev. 2).

~~7. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.~~

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1

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

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.

During refueling operations, the level in the spent fuel pool is in equilibrium with the refueling cavity when they are hydraulically coupled, and the level in the refueling cavity is checked daily in accordance with SR 3.9.7.1.

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.7.4.
4. Regulatory Guide 1.183, July 2000.
5. 10 CFR 50.67.

BASES

LCO

The spent fuel pool boron concentration is required to be ≥ 300 ppm for the Holtec spent fuel pool storage racks. The specified concentration of dissolved boron in the spent fuel pool preserves the assumptions used in the analyses of the potential critical accident scenarios as described in References 2 and 3. The dissolved boron concentration of 300 ppm bounds the minimum required concentration for accidents occurring during fuel assembly movement within the spent fuel pool for the Holtec spent fuel pool storage racks.

APPLICABILITY

This LCO applies whenever fuel assemblies are stored in the spent fuel pool.

ACTIONS

The ACTIONS have been modified by a Note indicating that LCO 3.0.3 does not apply.

A.1 and A.2

When the concentration of boron in the spent fuel pool is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This is most efficiently achieved by immediately suspending the movement of fuel assemblies. This does not preclude movement of a fuel assembly to a safe position. Immediate actions are also taken to restore spent fuel pool boron concentration.

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

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies that the concentration of boron in the spent fuel pool is within the required limit. As long as this SR is met, the analyzed accidents are fully addressed. ~~The 7 day frequency is appropriate based on operating experience and takes into consideration that no major replenishment of spent fuel pool water is expected to occur over such a short period of time.~~

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

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 9). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in general conformance with the recommendations of Regulatory Guide 1.9 (Ref. 3), and Regulatory Guide 1.137 (Ref. 11), as addressed in the UFSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3950 V is 95% of the nominal 4160 V output voltage. This value allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of 4580 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1

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.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 to maintain the unit in a safe shutdown condition.

Each SR 3.8.1.2 and SR 3.8.1.7 DG start requires the DG to achieve and maintain a steady state voltage and frequency range. The start signals used for this test may consist of one of the following signals:

a. Manual;

b. Simulated loss of ESF bus voltage by itself;

c. Simulated loss of ESF bus voltage in conjunction with an ESF actuation test signal; or

d. An ESF actuation test signal by itself.

For the purpose of SR 3.8.1.2 testing, the DGs are started from standby conditions ~~once per 31 days~~. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer's recommended operating range (low lube oil and jacket water temperature alarm settings to the high lube oil and jacket water temperature alarm settings).

For the purposes of SR 3.8.1.7 testing, the DGs are started from normal standby conditions ~~once per 184 days~~. Normal standby conditions for a DG mean that the diesel engine coolant and oil are being circulated (i.e., coolant is circulated based on temperature and oil is circulated continuously) and temperature is being maintained within the prescribed temperature bands of these subsystems when the diesel generator has been at rest for an extended period of time with the prelube oil and jacket water circulating systems operational. The prescribed temperature band is 110°F - 150°F which accounts for instrument tolerances. DG starts for these Surveillances are followed by a warmup period prior to loading.

BASES

SURVEILLANCE REQUIREMENTS (continued)

In order to reduce stress and wear on diesel engines, a modified start is used in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of starts in accordance with SR 3.8.1.2.

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

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

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

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

The 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 for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 8). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures.

Although no power factor requirements are established by this SR, the DG is normally operated between 0 and 1000 kVARs. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The 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 for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3).~~

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients (e.g., changing bus loads) do not invalidate this test. Similarly, momentary kVAR transients outside of the specified range do not invalidate the test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil for a minimum of 1 hour of DG operation at full load plus 10%.

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

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day tanks ~~once every 31 days~~ eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 11).~~ This SR is for preventative maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

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 3.8.1.6

This Surveillance demonstrates that each required (one of two transfer pumps per DG is "required" to support DG OPERABILITY) fuel oil transfer pump operates and transfers fuel oil from its associated storage tank(s) to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

~~The design of fuel transfer systems is such that one pump will operate automatically in order to maintain an adequate volume of fuel oil in the day tank during or following DG testing. Therefore, a 31 day Frequency is appropriate.~~

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 3.8.1.8

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. ~~The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The single largest post-accident load associated with each DG is the Essential Service Water (SX) pump (1290 brake horsepower, 1034 kW at full load conditions). This Surveillance is accomplished by simultaneously tripping loads supplied by the DG which have a minimum combined load equivalent to the single largest post-accident load. This method is employed due to the difficulty of attaining SX full load conditions during normal plant operations.

As required by IEEE-308 (Ref. 10), 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 (64.5 Hz), or 15% above synchronous speed (69 Hz), whichever is lower.

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 voltage and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. ~~The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3).~~

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.10

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

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

This SR has been modified by two Notes. Note 1 states that momentary transients above the stated voltage limit immediately following a load rejection (i.e., the DG full load rejection) do not invalidate this test. The momentary transient is that which occurs immediately after the circuit breaker is opened, lasts a few milliseconds, and may or may not be observed on voltage recording or monitoring instrumentation. The reason for Note 2 is that during operation with the reactor critical, performance of this SR could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.11

In general conformance with the recommendations of Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.4, this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time, and maintain a steady state voltage and frequency range.

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

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or Residual Heat Removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

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.

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

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

SR 3.8.1.12

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.14

Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.9, recommends demonstration ~~once per 18 months~~ that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 2 hours of which is at a load band equivalent to 105% to 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are also applicable to this SR.

Although no power factor requirements are established by this SR, a portion of the testing is performed between 0 and 1000 kVARs. The practice of performing this entire test at rated power factor has been determined to be unjustified, potentially destructive, testing due to exceeding the vendors recommendation for maximum voltage of the generator if the DG output breaker should open during testing. Therefore, the DG is to be operated at rated power factor for only a short duration during the performance of this surveillance in accordance with the following guidance:

During the period that the DG is loaded at ≥ 5500 kW and ≤ 1000 kVAR, the following shall be performed once to verify DG operability at rated power factor:

a. Over a two minute period, raise kVAR loading to 4125 kVAR;

b. Operate the DG at 4125 kVAR for 1 minute or until kVAR and kW loading has stabilized; and

c. Reduce kVAR loading to ≤ 1000 kVAR.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

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.

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

This Surveillance is modified by a Note which states that momentary transients (e.g., due to changing bus loads) do not invalidate this test.

SR 3.8.1.15

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

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Alternatively, the DG can be operated until operating temperatures have stabilized. Note 2 states that momentary transients (e.g., due to changing bus loads) do not invalidate this test.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.16

As required by Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.11, this Surveillance ensures that the manual synchronization and load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

The 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 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), and takes into consideration unit conditions required to perform the Surveillance.~~

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a LOCA actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 10), paragraph 6.2.6(2).

The intent in the requirement associated with SR 3.8.1.17.b is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable.

This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

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

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident and loss of offsite power conditions, loads are sequentially connected to the bus by the automatic 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 interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

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

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

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 ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

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

This SR is modified by a Note. The reason for the Note is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

SR 3.8.1.20

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

The 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 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3).~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at the post loss of coolant accident load demand discussed in the UFSAR, Section 9.5.4.2 (Ref. 1). The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

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

SR 3.8.3.2

The tests of fuel oil prior to addition to the storage tank(s) are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for 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 sampling (and associated results) of new fuel and addition of new fuel oil to the storage tank to exceed 30 days. The tests, limits, and applicable ASTM Standards for the tests listed in the Diesel Fuel Oil Testing Program of Specification 5.5.13 are as follows:

BASES

SURVEILLANCE REQUIREMENTS (continued)

Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

Particulate concentrations should be determined in accordance with ASTM D5452-98 (Ref. 6). This method involves a 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. Each tank must be considered and tested separately since the total stored fuel oil volume is contained in two or more interconnected tanks.

The Frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals.

SR 3.8.3.3

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel storage tanks ~~once every 31 days~~ eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, and contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~The Surveillance Frequencies are established consistent with the recommendations of Regulatory Guide 1.137 (Ref. 2).~~ This SR is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during performance of the Surveillance.

The 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

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 connected loads and the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state, while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer (2.20 Vpc or 127.6 volts at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). ~~The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 8).~~

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 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 8 ~~9~~), the battery charger output capacity is recommended to be based on the largest combined demands of the various steady state loads and the charging demands to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying 400 amps at the minimum established float voltage for 8 hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least 2 hours.

SURVEILLANCE REQUIREMENTS (continued)

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest coincident demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ 3 amps. This option is required to be performed during MODES 5 and 6 since it would require the DC electrical power subsystem to be inoperable during performance of the test.

~~The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this frequency is intended to be consistent with expected fuel cycle lengths.~~

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 3.8.4.3

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

~~The Surveillance Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests, not to exceed 18 months.~~

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The reason for Note 2 is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.

2. Regulatory Guide 1.6, March 10, 1971.

3. IEEE-308-1978.

4. UFSAR, Chapter 8.

5. UFSAR, Chapter 6.

6. UFSAR, Chapter 15.

7. Regulatory Guide 1.93, December 1974

8. ~~IEEE-450-1995.~~

~~9.~~ Regulatory Guide 1.32, February 1977.

~~10. Regulatory Guide 1.129, December 1974.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 1). ~~The 7 day Frequency is consistent with IEEE-450 (Ref. 1).~~

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 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 3 amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained.

SR 3.8.6.2 and SR 3.8.6.5

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 127.6 volts at the battery terminals, or 2.20 Vpc. This provides adequate over-potential, 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 5.5.17. 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 volts. ~~The Frequency for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. 1).~~

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 3.8.6.3

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. ~~The Frequency is consistent with IEEE-450 (Ref. 1).~~

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 3.8.6.4

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., 60ºF). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. ~~The Frequency is consistent with IEEE-450 (Ref. 1).~~

SR 3.8.6.6

A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.6.6, however, only the modified performance discharge test may be used to satisfy the battery service test requirements of SR 3.8.4.3.

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery’s ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test and the test discharge rate must envelop the duty cycle of the service test if the modified performance discharge test is performed in lieu of a service test.

BASES

SURVEILLANCE REQUIREMENTS (continued

It may consist of just two rates: for instance the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which envelop the duty cycle of the service test. Since the ampere-hours removed by a one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test must remain above the minimum battery terminal voltage specified in the battery service test for the duration of time equal to that of the service test.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 1) and IEEE-485 (Ref. 5). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

The Frequency 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 and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to IEEE-450 (Ref. 1), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is > 10% below the manufacturer's rating. These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1).

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC instrument buses energized from the inverter. The verification of proper voltage output ensures that the required power is readily available for the instrumentation of the RPS and ESFAS connected to the AC instrument 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.

REFERENCES

1. UFSAR, Chapter 8.
2. UFSAR, Chapter 6.
3. UFSAR, Chapter 15.
4. Safety Evaluation, dated November 19, 2003, associated with Byron Technical Specification Amendment No. 135 and Braidwood Technical Specification Amendment No. 129.

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 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and required AC instrument buses energized. The verification of proper voltage output ensures that the required power is readily available for the instrumentation connected to the AC instrument buses. ~~The 7 day Frequency takes into account the reliability of the instrument bus power sources and other indications available in the control room that alert the operator to malfunctions.~~

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

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 AC instrument bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. ~~The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC instrument bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.

BASES

ACTIONS (continued)

Notwithstanding performance of the above conservative Required Actions, a required Residual Heat Removal (RHR) train and/or a required Low Temperature Overpressure Protection (LTOP) feature, may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the RHR or LTOP ACTIONS would not be entered. Therefore, Required Actions A.2.5 and A.2.6 are provided to direct declaring RHR and LTOP features inoperable and declaring the associated RHR train "not in operation" (note, this does not require the RHR train to be shut down if operating, only that the associated RHR train not be credited as the required operating train), which results in taking the appropriate actions.

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 unit safety systems may be without power.

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC instrument bus electrical power distribution subsystems are functioning properly, with all the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. ~~The 7 day Frequency takes into account the capability of the 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.

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

This SR ensures that the coolant boron concentration in all filled portions of the RCS, the refueling canal, and the refueling cavity, that are hydraulically coupled with the reactor core, is within the COLR limits. The boron concentration of the coolant in each volume is determined periodically by chemical 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.

~~A Frequency of once every 72 hours is a reasonable amount of time to verify the boron concentration of representative samples. The Frequency is based on operating experience, which has shown 72 hours to be adequate to detect slow trends in boron concentration in these volumes prior to significant reduction.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. UFSAR, Section 9.3.4.
3. UFSAR, Section 15.4.6.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

These valves are to be secured closed to isolate possible dilution paths. The likelihood of a significant reduction in the boron concentration during MODE 6 operations is remote due to the large mass of borated water in the refueling cavity and the fact that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked ~~every 72 hours~~ during MODE 6 under SR 3.9.1.1. This SR demonstrates that valves CV111B, CV8428, CV8441, CV8435, and CV8439 are secured closed by the use of mechanical stops, removal of air, or removal of electrical power. Alternate valves may be secured closed in lieu of these unborated water source isolation valves provided it is ensured that the potential dilution water sources are isolated.

In the unlikely event that the RWST or the BAST becomes a dilution source (i.e., its boron concentration less than the refueling boron concentration specified in the COLR) all required isolation valves must be secured in the closed position to isolate all possible dilution paths. With the RWST considered a potential dilution source, all suction source isolation valves (CV112D, CV112E, SI8806, SI8812A, SI8812B, and SI8927) must be secured in the closed position. With the BAST considered a potential dilution source, the emergency boration valve (CV8104) must be secured in the closed position. Verification of the secured valve position through a system walkdown ensures the isolation of possible dilution paths.

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 and is considered reasonable in view of other administrative controls that will ensure that the valve opening is an unlikely possibility.~~

REFERENCES

1. UFSAR, Section 15.4.6.
2. NUREG-0800, Section 15.4.6.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

SR 3.9.3.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions.

~~The Frequency of 12 hours is consistent with the CHANNEL CHECK Frequency specified similarly for the same instruments in LCO 3.3.1.~~

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 3.9.3.2

SR 3.9.3.2 is the performance of a CHANNEL CALIBRATION ~~every 18 months~~. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the source range neutron flux monitors consists of obtaining the detector discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.~~

REFERENCES

1. UFSAR, Table 7.5-2.
2. 10 CFR 50, Appendix A, GDC 13, GDC 26, GDC 28, and GDC 29.
3. UFSAR, Section 15.4.6.

BASES

APPLICABILITY

The containment penetration requirements are applicable during movement of RECENTLY IRRADIATED FUEL assemblies within containment because this is when there is a potential for a limiting fuel handling accident. In MODES 1, 2, 3, and 4, containment penetration requirements are addressed by LCO 3.6.1. In MODE 5, and in MODE 6 when movement of RECENTLY IRRADIATED FUEL assemblies within containment are not being conducted, the potential for a limiting fuel handling accident does not exist. Therefore, under these conditions no requirements are placed on containment penetration status.

ACTIONS

A.1

If the containment equipment hatch, air lock doors, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere is not in the required status, the unit must be placed in a condition where containment closure is not needed. This is accomplished by immediately suspending movement of RECENTLY IRRADIATED FUEL assemblies within containment. Performance of these actions shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that each of the containment penetrations required to be isolated is isolated. This Surveillance for the open purge valves demonstrates that the valves are not blocked from closing. Also the Surveillance will demonstrate that each valve operator has motive power which will ensure that each valve is capable of being closed by an OPERABLE automatic Containment Ventilation Isolation 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.

~~The Surveillance is performed every 7 days during movement of RECENTLY IRRADIATED FUEL assemblies within containment. As such, this Surveillance ensures that a postulated fuel handling accident involving RECENTLY IRRADIATED FUEL that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the environment.~~

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 3.9.4.2

This Surveillance demonstrates that each required containment purge valve actuates to its isolation position on an actual or simulated high radiation signal. ~~In TS 3.3.6, the Containment Ventilation Isolation instrumentation requires a CHANNEL CHECK every 12 hours and a COT every 92 days to ensure the channel OPERABILITY during refueling operations. Every 18 months a CHANNEL CALIBRATION is performed.~~ SR 3.9.4.3 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These Surveillances will ensure that the valves are capable of closing after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

SR 3.9.4.3

This Surveillance demonstrates that the isolation time of each required containment purge valve providing direct access from the containment atmosphere to the outside atmosphere is in accordance with the Inservice Testing Program requirements. This SR, along with SR 3.9.4.2, ensures the containment purge valves in penetrations which provide direct access from the containment atmosphere to the outside atmosphere are capable of closing after a postulated fuel handling accident to limit the release of fission product radioactivity from the containment.

REFERENCES

1. UFSAR, Section 15.7.4.
2. NUREG-0800, Section 15.0.1, Revision 0, July 2000.
3. NUREG-0800, Section 9.1.3.
4. Regulatory Guide 1.183, July 2000.
5. 10 CFR 50.67.

BASES

ACTIONS (continued)

With the RHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Therefore, all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere must be closed within 4 hours. Closing containment penetrations that are open to the outside atmosphere ensures dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that the RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to provide mixing of the borated coolant to prevent thermal and boron stratification in the core. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator in the control room for monitoring the RHR System.~~ 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. UFSAR, Section 5.4.7.

BASES

ACTIONS (continued)

With no RHR loop in operation, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Therefore, all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere must be closed within 4 hours. Closing containment penetrations that are open to the outside atmosphere ensures that dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

This Surveillance demonstrates that one RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to provide mixing of the borated coolant to prevent thermal and boron stratification in the core. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator for monitoring the RHR System 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.

SR 3.9.6.2

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

REFERENCES

1. UFSAR, Section 5.4.7.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the analysis of the postulated fuel handling accident during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a fuel handling accident inside containment (Ref. 2).

The 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 of valve positions, which make significant unplanned level changes unlikely.~~

REFERENCES

1. Regulatory Guide 1.183, July 2000.
2. UFSAR, Section 15.7.4.
3. 10 CFR 50.67.
4. NUREG-0800, Section 9.1.3.

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
SHUTDOWN MARGIN (SDM)	**3.1.1**	**3.1.1**
Verify SDM	3.1.1.1	3.1.1.1
Core Reactivity	**3.1.2**	**3.1.2**
Verify measured core reactivity within predicted value	3.1.2.1	3.1.2.2
Rod Group Alignment Limits	**3.1.4**	**3.1.4**
Verify individual rod positions	3.1.4.1	3.1.4.1
Verify rod freedom of movement	3.1.4.2	3.1.4.2
Shutdown Bank Insertion Limits	**3.1.5**	**3.1.5**
Verify each shutdown bank within insertion limits	3.1.5.1	3.1.5.1
Control Bank Insertion Limits	**3.1.6**	**3.1.6**
Verify each control bank insertion is within limits	3.1.6.2	3.1.6.2
Verify sequence and overlap limits are met	3.1.6.3	3.1.6.3
PHYSICS TESTS Exceptions – MODE 2	**3.1.8**	**3.1.8**
Verify RCS lowest loop average temperature	3.1.8.2	3.1.8.2
Verify THERMAL POWER	3.1.8.3	3.1.8.3
Verify SDM	3.1.8.4	3.1.8.4
Heat Flux Hot Channel Factor ($F_Q(Z)$) (CAOC-F_{xy} Methodology)	**3.2.1A**	**------**
Verify measured values of $F_Q(Z)$	3.2.1.1	---------
Verify $F^C_{XY} < F^L_{XY}$	3.2.1.2	---------
Heat Flux Hot Channel Factor ($F_Q(Z)$) (RAOC-W(Z) Methodology)	**3.2.1B**	**3.2.1**
Verify $F^C_Q(Z)$ [Braidwood – PDMS inoperable]	3.2.1.1	3.2.1.1
Verify $F^W_Q(Z)$ [Braidwood – PDMS inoperable]	3.2.1.2	3.2.1.2
Verify $F^C_Q(Z)$ [Braidwood – PDMS OPERABLE]	---------	3.2.1.3
Verify $F^W_Q(Z)$ [Braidwood – PDMS OPERABLE]	---------	3.2.1.4
Heat Flux Hot Channel Factor ($F_Q(Z)$) (CAOC-W(Z) Methodology)	**3.2.1C**	**------**
Verify $F^C_Q(Z)$	3.2.1.1	---------
Verify $F^W_Q(Z)$	3.2.1.2	---------
Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)	**3.2.2**	**3.2.2**
Verify $F^N_{\Delta H}$ [Braidwood – PDMS inoperable]	3.2.2.1	3.2.2.1
Verify $F^N_{\Delta H}$ [Braidwood – PDMS OPERABLE]	---------	3.2.2.2
AXIAL FLUX DIFFERENCE (AFD) (Constant Axial Offset Control (CAOC) Methodology)	**3.2.3A**	**------**
Verify AFD	3.2.3.1	---------
Update target flux difference	3.2.3.2	---------
Determine target flux difference	3.2.3.3	---------
AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)	**3.2.3B**	**3.2.3**
Verify AFD	3.2.3.1	3.2.3.1
Quadrant Power Tilt Ratio (QPTR)	**3.2.4**	**3.2.4**
Verify QPTR by calculation	3.2.4.1	3.2.4.1
Verify QPTR using movable incore detectors	3.2.4.2	3.2.4.2

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
Departure From Nucleate Boiling Ration (DNBR)	**------**	**3.2.5**
Verify DNBR	---------	3.2.5.1
Reactor Trip System (RTS) Instrumentation	**3.3.1**	**3.3.1**
Channel Check	3.3.1.1	3.3.1.1
Compare calorimetric heat balance to power range	3.3.1.2	3.3.1.2
Compare incore detector measurements to NIS AFD	3.3.1.3	3.3.1.3
TADOT (62 days)	3.3.1.4	3.3.1.4
Actuation Logic Test	3.3.1.5	3.3.1.5
Calibrate excore channels	3.3.1.6	3.3.1.6
COT (184 days)	3.3.1.7	3.3.1.7
COT (P-6 and P-10)	3.3.1.8	3.3.1.8
TADOT (92 days)	3.3.1.9	3.3.1.9
Channel Calibration (includes verification of time constants)	3.3.1.10	3.3.1.10
Channel Calibration	3.3.1.11	3.3.1.11
Channel Calibration	3.3.1.12	---------
COT (18 months)	3.3.1.13	3.3.1.12
TADOT (18 months)	3.3.1.14	3.3.1.13
Verify RTS Response Time	3.3.1.16	3.3.1.15
Engineered Safety Features Actuation System (ESFAS) Instrumentation	**3.3.2**	**3.3.2**
Channel Check	3.3.2.1	3.3.2.1
COT (31 days)	---------	3.3.2.2
TADOT (31 days)	---------	3.3.2.3
Actuation Logic Test (92 days)	3.3.2.2	3.3.2.4
Actuation Logic Test (31 days)	3.3.2.3	---------
Master Relay Test	3.3.2.4	3.3.2.5
COT (184 days)	3.3.2.5	3.3.2.6
Slave Relay Test	3.3.2.6	3.3.2.8
TADOT (92 days)	3.3.2.7	3.3.2.7
TADOT (18 months)	3.3.2.8	3.3.2.9
Channel Calibration	3.3.2.9	3.3.2.10
Verify ESFAS Response Times [Braidwood – Loss of Offsite Power]	---------	3.3.2.11
Verify ESFAS Response Times	3.3.2.10	3.3.2.12
Post Accident Monitor (PAM) Instrumentation	**3.3.3**	**3.3.3**
Channel Check	3.3.3.1	3.3.3.1
Calibration	3.3.3.2	3.3.3.2
Remote Shutdown System	**3.3.4**	**3.3.4**
Channel Check	3.3.4.1	3.3.4.1
Verify control circuit and transfer switch capable of function	3.3.4.2	----------
Channel Calibration	3.3.4.3	3.3.4.2
TADOT	3.3.4.4	---------
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation	**3.3.5**	**3.3.5**
Channel Check	3.3.5.1	---------
TADOT	3.3.5.2	3.3.5.1
Channel Calibration	3.3.5.3	3.3.5.2

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
Containment Purge and Exhaust Isolation Instrumentation [Containment Ventilation Isolation Instrumentation]	**3.3.6**	**3.3.6**
Channel Check	3.3.6.1	3.3.6.1
Actuation Logic Test (31 days)	3.3.6.2	---------
Master Relay Test (31 days)	3.3.6.3	-----------
Actuation Logic Test (92 days)	3.3.6.4	3.3.6.2
Master Relay Test (92 days)	3.3.6.5	3.3.6.3
COT	3.3.6.6	3.3.6.4
Slave Relay Test	3.3.6.7	3.3.6.5
TADOT	3.3.6.8	---------
Channel Calibration	3.3.6.9	3.3.6.6
Control Room Emergency Filtration System (CREFS) [Control Room Ventilation (VC) Filtration System] Actuation Instrumentation	**3.3.7**	**3.3.7**
Channel Check	3.3.7.1	3.3.7.1
COT	3.3.7.2	3.3.7.2
Actuation Logic Test (31 days)	3.3.7.3	---------
Master Relay Test (31 days)	3.3.7.4	---------
Actuation Logic Test (92 days)	3.3.7.5	---------
Master Relay Test (92 days)	3.3.7.6	---------
Slave Relay Test	3.3.7.7	---------
TADOT	3.3.7.8	---------
Channel Calibration	3.3.7.9	3.3.7.3
Fuel Building Air Cleanup System (FBACS) [Fuel Handling Building Exhaust Filter Plenum (FHB) Ventilation System] Actuation Instrumentation	**3.3.8**	**3.3.8**
Channel Check	3.3.8.1	3.3.8.1
COT	3.3.8.2	3.3.8.2
Actuation Logic Test	3.3.8.3	---------
TADOT	3.3.8.4	---------
Channel Calibration	3.3.8.5	3.3.8.3
Boron Dilution Protection System (BDPS)	**3.3.9**	**3.3.9**
Verify reactor coolant pumps in operation	---------	3.3.9.1
Verify each RCS loop isolation valve open	---------	3.3.9.2
Channel Check	3.3.9.1	3.3.9.3
Verify Boron Dilution Alert channel selector in Normal	---------	3.3.9.4
Verify position of flow path valves	---------	3.3.9.5
COT	3.3.9.2	3.3.9.6
Channel Calibration	3.3.9.3	3.3.9.7
RCS Pressure, Temperature and Flow DNB Limits	**3.4.1**	**3.4.1**
Verify pressurize pressure	3.4.1.1	3.4.1.1
Verify RCS average temperature	3.4.1.2	3.4.1.2
Verify RCS total flow rate	3.4.1.3	3.4.1.3
Verify RCS total flow by precision heat balance	3.4.1.4	3.4.1.4

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
RCS Minimum Temperature for Criticality	**3.4.2**	**3.4.2**
Verify RCS T_{avg}	3.4.2.1	3.4.2.1
RCS Pressure/Temperature Limits	**3.4.3**	**3.4.3**
Verify RCS pressure, temperature, and heatup and cooldown rates	3.4.3.1	3.4.3.1
RCS Loops – MODES 1 and 2	**3.4.4**	**3.4.4**
Verify RCS loops in operation	3.4.4.1	3.4.4.1
RCS Loops – MODE 3	**3.4.5**	**3.4.5**
Verify required RCS loops in operation	3.4.5.1	3.4.5.1
Verify Steam generator secondary side water levels	3.4.5.2	3.4.5.2
Verify correct breaker alignment	3.4.5.3	3.4.5.3
RCS Loops – MODE 4	**3.4.6**	**3.4.6**
Verify required RHR or RCS loop operation	3.4.6.1	3.4.6.1
Verify SG secondary side water level	3.4.6.2	3.4.6.2
Verify correct breaker alignment	3.4.6.3	3.4.6.3
RCS Loops – MODE 5, Loops Filled	**3.4.7**	**3.4.7**
Verify required RHR loop operation	3.4.7.1	3.4.7.1
Verify SG secondary side water level	3.4.7.2	3.4.7.2
Verify correct breaker alignment	3.4.7.3	3.4.7.3
RCS Loops – MODE 5, Loops Not Filled	**3.4.8**	**3.4.8**
Verify required RHR loop operation	3.4.8.1	3.4.8.1
Verify correct breaker alignment	3.4.8.2	3.4.8.2
Pressurizer	**3.4.9**	**3.4.9**
Verify pressurizer water level	3.4.9.1	3.4.9.1
Verify required pressurizer heater group capacity	3.4.9.2	3.4.9.2
Verify required pressurizer heater emergency power	3.4.9.3	3.4.9.3
Pressurizer PORVs	**3.4.11**	**3.4.11**
Perform cycle of block valve	3.4.11.1	3.4.11.1
Perform cycle of PORV	3.4.11.2	3.4.11.2
Perform cycle of solenoid air control valve	3.4.11.3	3.4.11.3
Verify emergency power to PORVs and block valves	3.4.11.4	---------
Low Temperature Overpressure Protection (LTOP) System	**3.4.12**	**3.4.12**
Verify maximum number of HPI pumps [SI Pumps]	3.4.12.1	3.4.12.1
Verify maximum number of charging pumps	3.4.12.2	3.4.12.2
Verify each accumulator isolated	3.4.12.3	3.4.12.3
Verify RHR suction valve open	3.4.12.4	3.4.12.5
Verify required vent open	3.4.12.5	3.4.12.4
Verify PORV block valve open	3.4.12.6	3.4.12.6
Verify RHR suction isolation locked open	3.4.12.7	---------
COT	3.4.12.8	3.4.12.7
Channel Calibration	3.4.12.9	3.4.12.8
RCS Operational Leakage	**3.4.13**	**3.4.13**
Verify RCS operational leakage	3.4.13.1	3.4.13.1
Verify primary to secondary leakage	3.4.13.2	3.4.13.2

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
RCS Pressure Isolation Valve (PIV) Leakage	**3.4.14**	**3.4.14**
Verify RCS PIV Leakage	3.4.14.1	3.4.14.1
Verify RHR System autoclosure interlock prevents opening valves	3.4.14.2	3.4.14.2
Verify RHR System autoclosure interlock closes valves	3.4.14.3	---------
RCS Leakage Detection Instrumentation	**3.4.15**	**3.4.15**
Channel Check (required radioactivity monitor)	3.4.15.1	3.4.15.1
COT (required radioactivity monitor)	3.4.15.2	3.4.15.2
Channel Calibration (required containment sump monitor)	3.4.15.3	3.4.15.3
Channel Calibration (required radioactivity monitor)	3.4.15.4	3.4.15.4
Channel Calibration (required containment air cooler condensate flow rate monitor)	3.4.15.5	---------
RCS Specific Activity	**3.4.16**	**3.4.16**
Verify gross specific activity	3.4.16.1	3.4.16.1
Verify Dose Equivalent I-131	3.4.16.2	3.4.16.2
Determine $\bar{E}$	3.4.16.3	3.4.16.3
RCS Loop Isolation Valves	**3.4.17**	**3.4.17**
Verify RCS loop isolation valve status	3.4.17.1	3.4.17.1
RCS Loops – Test Exceptions	**3.4.19**	**------**
Verify Thermal Power	3.4.19.1	---------
Accumulators	**3.5.1**	**3.5.1**
Verify accumulator isolation valves open	3.5.1.1	3.5.1.1
Verify borated water volume	3.5.1.2	3.5.1.2
Verify nitrogen cover pressure	3.5.1.3	3.5.1.3
Verify boron concentration	3.5.1.4	3.5.1.4
Verify isolation valve operator power removed	3.5.1.5	3.5.1.6
ECCS - Operating	**3.5.2**	**3.5.2**
Verify valves in correct position with power removed	3.5.2.1	3.5.2.1
Verify ECCS valve position	3.5.2.2	3.5.2.2
Verify ECCS piping is full	3.5.2.3	3.5.2.3
Verify ECCS automatic valves actuate automatically	3.5.2.5	3.2.5.5
Verify ECCS pumps start automatically	3.5.2.6	3.5.2.6
Verify ECCS throttle valve stop position	3.5.2.7	3.5.2.7
Verify sump suction strainers	3.5.2.8	3.5.2.8
Refueling Water Storage Tank (RWST)	**3.5.4**	**3.5.4**
Verify RWST water temperature	3.5.4.1	3.5.4.1
Verify RWST vent path temperature	---------	3.5.4.2
Verify RWST water volume	3.5.4.2	3.5.4.3
Verify RWST boron concentration	3.5.4.3	3.5.4.4
Seal Injection Flow	**3.5.5**	**3.5.5**
Verify manual seal injection throttle valve adjustment	3.5.5.1	3.5.5.1
Boron Injection Tank (BIT)	**3.5.6**	**------**
Verify BIT water temperature	3.5.6.1	---------
Verify BIT water volume	3.5.6.2	---------
Verify BIT boron concentration	3.5.6.3	--------

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
Containment Air Locks (Atmospheric, Subatmospheric, Ice Condenser, and Dual)	**3.6.2**	**3.6.2**
Verify only one door can be opened at a time	3.6.2.2	3.6.2.2
Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)	**3.6.3**	**3.6.3**
Verify purge valve is sealed closed	3.6.3.1	3.6.3.1
Verify each 8 inch purge valve is closed	3.6.3.2	3.6.3.2
Verify each containment isolation manual valve outside containment is closed	3.6.3.3	3.6.3.3
Verify isolation time of automatic power-operated containment isolation valves	3.6.3.5	3.6.3.5**
Cycle check valves	3.6.3.6	-----------
Perform leakage rate testing for containment purge valves with resilient seals	3.6.3.7	3.6.3.6 3.6.3.7
Verify automatic containment isolation valves actuate	3.6.3.8	3.6.3.8
Cycle check valves not testable during normal operation	3.6.3.9	---------
Verify containment purge valve blocked to limit opening	3.6.3.10	---------
Containment Pressure (Atmospheric, Dual, and Ice Condenser)	**3.6.4A**	**3.6.4**
Verify containment pressure	3.6.4A.1	3.6.4.1
Containment Pressure (Subatmospheric)	**3.6.4B**	**------**
Verify containment air partial pressure	3.6.4B.1	---------
Containment Air Temperature (Atmospheric and Dual)	**3.6.5A**	**3.6.5**
Verify containment average air temperature	3.6.5A.1	3.6.5.1
Containment Air Temperature (Ice Condenser)	**3.6.5B**	**------**
Verify containment upper compartment average air temperature	3.6.5B.1	---------
Verify containment lower compartment average air temperature	3.6.5B.2	---------
Containment Air Temperature (Subatmospheric)	**3.6.5C**	**------**
Verify containment average air temperature	3.6.5C.1	---------
Containment Spray and Cooling Systems (Atmospheric and Dual)(Credit taken for iodine removal by the Containment Spray System)	**3.6.6A**	**------**
Verify each containment spray valve in correct position	3.6.6A.1	---------
Operate containment cooling train fan	3.6.6A.2	---------
Verify containment cooling train cooling water flow	3.6.6A.3	---------
Verify automatic containment spray valves actuate	3.6.6A.5	---------
Verify containment spray pumps automatically start	3.3.6A.6	---------
Verify containment cooling trains automatically start	3.6.6A.7	---------
Verify spray nozzles unobstructed	3.6.6A.8	---------
Containment Spray and Cooling Systems (Atmospheric and Dual)(Credit not taken for iodine removal by the Containment Spray System)	**3.6.6B**	**3.6.6**
Verify each containment spray valve in correct position	3.6.6A.1	3.6.6.1
Operate containment cooling train fan	3.6.6A.2	3.6.6.2
Verify containment cooling train cooling water flow	3.6.6A.3	3.6.6.3
Verify automatic containment spray valves actuate	3.6.6A.5	3.6.6.5

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
Verify containment spray pumps automatically start	3.3.6A.6	3.6.6.6
Verify containment cooling trains automatically start	3.6.6A.7	3.6.6.7
Verify spray nozzles unobstructed [Braidwood SR 3.6.6.8 – Following maintenance or fluid flow through nozzle]	3.6.6A.8	---------
Containment Spray and Cooling Systems (Ice Condenser)	**3.6.6C**	**------**
Verify each containment spray valve in correct position	3.6.6C.1	---------
Verify automatic containment spray valves actuate	3.6.6C.3	---------
Verify containment spray pumps automatically start	3.6.6C.4	---------
Verify spray nozzles unobstructed	3.6.6C.5	---------
Quench Spray (QS) System (Subatmospheric)	**3.6.6D**	**------**
Verify each QS valve in correct position	3.6.6D.1	---------
Verify automatic QS valves actuate	3.6.6D.3	---------
Verify QS pumps automatically start	3.6.6D.4	---------
Verify spray nozzles unobstructed	3.6.6D.5	---------
Recirculation Spray (RS) System (Subatmospheric)	**3.6.6E**	**------**
Verify casing cooling tank temperature	3.6.6E.1	---------
Verify casing cooling tank borated water volume	3.6.6E.2	---------
Verify casing cooling tank boron concentration	3.6.6E.3	---------
Verify each RS valve in correct position	3.6.6E.4	---------
Verify RS valves and pumps automatically actuate	3.6.6E.6	---------
Verify spray nozzles unobstructed	3.6.6E.t	---------
Spray Additive System (Atmospheric, Ice Condenser, and dual)	**3.6.7**	**3.6.7**
Verify spray additive valves in correct position	3.6.7.1	3.6.7.1
Verify spray additive tank solution volume	3.6.7.2	3.6.7.2
Verify spray additive tank solution concentration	3.6.7.3	3.6.7.3
Verify automatic spray additive valves actuate	3.6.7.4	3.6.7.4
Verify spray additive flow rate	3.6.7.5	3.6.7.5
Shield Building (Dual and Ice Condenser)	**3.6.8**	**------**
Verify annulus negative pressure	3.6.8.1	---------
Verify one shield building door in each opening closed	3.6.8.2	---------
Verify shield building pressure can be maintained	3.6.8.4	---------
Hydrogen Mixing System (HMS) (Atmospheric, Ice Condenser, and Dual)	**3.6.9**	**-------**
Operate each HMS train	3.6.9.1	---------
Verify HMS train flow rate	3.6.9.2	---------
Verify HMS trains automatically start	3.6.9.3	---------
Hydrogen Ignition System (HIS) (Ice Condenser)	**3.6.10**	**------**
Energize each HIS train	3.6.10.1	---------
Verify hydrogen ignitor operability	3.6.10.2	---------
Energize each hydrogen ignitor and verify temperature	3.6.10.3	---------
Iodine Cleanup System (ICS) (Atmospheric and Subatmospheric)	**3.6.11**	**------**
Operate each ICS train	3.6.11.1	---------
Verify ICS trains automatically actuate	3.6.11.3	---------
Verify ICS filter bypass dampers can be opened	3.6.11.4	---------

ATTACHMENT 5
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Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser)	**3.6.13**	**------**
Operate SBACS trains	3.6.13.1	---------
Verify SBACS trains automatically actuate	3.6.13.3	---------
Verify SBACS filter bypass dampers open	3.6.13.4	
Verify SBACS train flow rates	3.6.13.5	
Air Return System (ARS) (Ice Condenser)	**3.6.14**	**------**
Verify ARS fans automatically start	3.6.14.1	---------
Verify ARS fan motor current and amps	3.6.14.2	---------
Verify each ARS fan damper opens	3.6.14.3	---------
Verify motor-operated valves actuate	3.6.14.4	---------
Ice Bed (Ice Condenser)	**3.6.15**	**-------**
Verify maximum ice bed temperature	3.6.15.1	---------
Verify total mass of stored ice	3.6.15.2	---------
Verify ice mass of sampled baskets	3.6.15.3	---------
Verify blockage of total flow area in limits	3.6.15.4	---------
Verify chemistry of stored ice	3.6.15.5	---------
Inspect baskets for physical damage	3.6.15.6	---------
Ice Condenser Doors (Ice Condenser)	**3.6.16**	**-------**
Verify inlet doors indicate closed	3.6.16.1	---------
Verify intermediate deck door closed	3.6.16.2	---------
Verify inlet doors not impaired	3.6.16.3	---------
Verify door opening torque	3.6.16.4	---------
Perform inlet door torque test	3.6.16.5	---------
Verify intermediate deck doors freedom of movement	3.6.16.6	---------
Verify top deck doors in place	3.6.16.7	---------
Divider Barrier Integrity (Ice Condenser)	**3.6.17**	**------**
Visually inspect personnel access doors and equipment hatches	3.6.17.2	---------
Test divider barrier seal test coupons	3.6.17.4	---------
Inspect divider barrier seal length, mounting bolts and seal material	3.6.17.5	---------
Containment Recirculation Drains (Ice Condenser)	**3.6.18**	**-------**
Visually inspect refueling canal drains	3.6.18.1	-----------
Verify ice condenser floor drain valves not impaired	3.6.18.2	-----------
Main Steam Isolation Valves (MSIVs)	**3.7.2**	**3.7.2**
Verify MSIVs automatically actuate	3.7.2.2	3.7.2.2
Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulation Valves (MFRVs) and [Associated Bypass Valves]	**3.7.3**	**------**
Verify MFIVs, MFRVs, and associated bypass valves automatically actuate	3.7.3.2	---------
Atmospheric Dump Valves [SG PORVs)	**3.7.4**	**3.7.4**
Verify one complete cycle of each valve	3.7.4.1	3.7.4.1
Verify one complete cycle of each block valve	3.7.4.2	3.7.4.2
Auxiliary Feedwater System	**3.7.5**	**3.7.5**
Verify AFW valves in correct position	3.7.5.1	3.7.5.1
Verify day tank volume	---------	3.7.5.2

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
Operate diesel driven AF pump	---------	3.7.5.3
Verify AFW automatic valves automatically actuate	3.7.5.3	3.7.5.5
Verify AFW pumps start automatically	3.7.5.4	3.7.5.6
Condensate Storage Tank (CST)	**3.7.6**	**3.7.6**
Verify CST level	3.7.6.1	3.7.6.1
Component Cooling Water (CCW)	**3.7.7**	**3.7.7**
Verify CCW valves in correct position	3.7.7.1	3.7.7.1
Verify automatic valves automatically actuate	3.7.7.2	---------
Verify SX valves to CC heat exchanger in correct position	---------	3.7.7.2
Verify CCW pumps automatically start	3.7.7.3	3.7.7.3
Service Water System (SWS) [Essential Service Water (SX) System]	**3.7.8**	**3.7.8**
Verify each SWS valve in correct position	3.7.8.1	3.7.8.1
Operate opposite-unit SX pump	---------	3.7.8.2
Cycle opposite-unit SX cross-tie valves	---------	3.7.8.3
Verify each SWS automatic valve automatically actuates	3.7.8.2	3.7.8.4
Verify each SWS pump automatically starts	3.7.8.3	3.7.8.5
Ultimate Heat Sink (UHS)	**3.7.9**	**3.7.9**
Verify UHS water level	3.7.9.1	3.7.9.1
Verify UHS average temperature	3.7.9.2	3.7.9.2
Verify bottom level of UHS	---------	3.7.9.3
Operate cooling tower fans	3.7.9.3	---------
Verify cooling tower fans automatically start	3.7.9.4	---------
Control Room Emergency Filtration (CREF) System [Control Room Ventilation (VC) Filtration System]	**3.7.10**	**3.7.10**
Operate each train	3.7.10.1	3.7.10.1
Verify each train automatically actuates	3.7.10.3	3.7.10.3
Verify ability to maintain positive pressure. [Braidwood SR 3.7.10.4 – Perform inleakage testing in accordance with Control Room Envelope Habitability Program]	3.7.10.4	---------
Control Room Emergency Air Temperature Control System (CREATCS) [Control Room Ventilation (VC) Temperature Control System]	**3.7.11**	**3.7.11**
Verify Control Room temperature	---------	3.7.11.1
Verify train capability to remove assumed heat load	3.7.11.1	3.7.11.2
Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS) [Nonaccessible Area Exhaust Filter Plenum Ventilation System]	**3.7.12**	**3.7.12**
Operate each train	3.7.12.1	3.7.12.1
Verify each train automatically actuates	3.7.12.3	3.7.12.3
Verify ability to maintain pressure	3.7.12.4	3.7.12.4
Verify filter bypass damper can be closed	3.7.12.5	---------
Fuel Building Air Cleanup System (FBACS) [Fuel Handling Building Exhaust Plenum (FB) Ventilation System]	**3.7.13**	**3.7.13**
Operate each train	3.7.13.1	3.7.13.1

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Verify one train maintains pressure (during movement of Recently Irradiated Fuel assemblies w/ equipment hatch not intact)	---------	3.7.13.3
Verify each train automatically actuates	3.7.13.3	3.7.13.4
Verify one train maintains pressure	3.7.13.4	3.7.13.5
Verify filter bypass damper can be closed	3.7.13.5	---------
Penetration Room Exhaust Air Cleanup System (PREACS)	**3.7.14**	**------**
Operate each train	3.7.14.1	---------
Verify each train automatically actuates	3.7.14.3	---------
Verify one train can maintain pressure	3.7.14.4	---------
Verify filter bypass damper can be closed	3.7.14.5	---------
Fuel Storage Pool [Spent Fuel Pool] Water Level	**3.7.15**	**3.7.14**
Verify water level	3.7.15.1	3.7.14.1
Fuel Storage Pool [Spent Fuel Pool] Boron Concentration	**3.7.16**	**3.7.15**
Verify boron concentration	3.7.16.1	3.7.15.1
Secondary Specific Activity	**3.7.18**	**3.7.3**
Verify specific activity	3.7.18.1	3.7.3.1
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
Verify each DG is synchronized and loaded	3.8.1.3	3.8.1.3
Verify each day tank volume	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 normal 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
Verify DG starts on ESF actuation signal	3.8.1.12	3.8.1.12
Verify DG automatic trips bypassed on ESF actuation 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 ESF actuation signal overrides test mode	3.8.1.17	3.8.1.17
Verify interval between each sequenced load block	3.8.1.18	3.8.1.18
Verify on LOOP in conjunction with ESF actuation 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 [Diesel Fuel Oil]	**3.8.3**	**3.8.3**
Verify fuel oil storage tank volume	3.8.3.1	3.8.3.1
Verify lube oil inventory volume	3.8.3.2	---------
Verify each DG air start receiver pressure	3.8.3.4	---------
Check/remove accumulated water from fuel oil storage tank	3.8.3.5	3.8.3.3
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

ATTACHMENT 5
TSTF-425 vs. Braidwood Station Cross-Reference

Technical Specification Section Title/Surveillance Description*	TSTF-425	Braidwood
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 and alignment	3.8.7.1	3.8.7.1
Inverters - Shutdown	**3.8.8**	**3.8.8**
Verify correct inverter voltage 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
Boron Concentration	**3.9.1**	**3.9.1**
Verify boron concentration	3.9.1.1	3.9.1.1
Unborated Water Source Isolation Valves	**3.9.2**	**3.9.2**
Verify each valve closed	3.9.2.1	3.9.2.1
Nuclear Instrumentation	**3.9.3**	**3.9.3**
Channel Check	3.9.3.1	3.9.3.1
Channel Calibration	3.9.3.2	3.9.3.2
Containment Penetrations	**3.9.4**	**3.9.4**
Verify each required containment penetration in required status	3.9.4.1	3.9.4.1
Verify each required containment purge and exhaust valve automatically actuates	3.9.4.2	3.9.4.2
RHR and Coolant Circulation – High Water Level	**3.9.5**	**3.9.5**
Verify one RHR loop in operation	3.9.5.1	3.9.5.1
RHR and Coolant Circulation – Low Water Level	**3.9.6**	**3.9.6**
Verify one RHR loop in operation	3.9.6.1	3.9.6.1
Verify breaker alignment	3.9.6.2	3.9.6.2
Refueling Cavity Water Level	**3.9.7**	**3.9.7**
Verify water level	3.9.7.1	3.9.7.1
Programs (Surveillance Frequency Control Program)	**5.5.18**	**5.5.19**

* The Technical Specification Section Title/Surveillance Description portion of this attachment is a summary description of the referenced TSTF-425 (NUREG-1431)/Braidwood Station TS Surveillances which is provided for information purposes only and is not intended to be a verbatim description of the TS Surveillances.

** This Braidwood Surveillance Frequency is provided in the Braidwood Inservice Testing (IST) Program. This Braidwood Surveillance Frequency is not proposed for inclusion in the Surveillance Frequency Control Program.

ATTACHMENT 6
Proposed No Significant Hazards Consideration

Description of Amendment Request: This amendment request involves the adoption of approved changes to the Standard Technical Specifications (STS) for Westinghouse plants (NUREG-1431), 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 NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," (ADAMS Accession No. 071360456).

Basis for proposed no significant hazards consideration: As required by 10 CFR 50.91(a), the 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 Updated Final Safety Analysis Report and Bases to the Technical Specifications), 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.

   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).