Attachment 1 to PLA-7119

PPL Susquehanna, LLC, Unit 1 and Unit 2 Proposed Technical Specification Amendment for Adoption of Task Force Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control--Risk Informed Technical Specification Task Force (RITSTF) Initiative 5"

1.0 DESCRIPTION

The proposed amendments would modify Susquehanna SES 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 5." Additionally, the change would add a new program, the Surveillance Frequency Control Program, to TS Section 5.0, Administrative Controls.

The changes are consistent with NRC approved Industry/TSTF STS change TSTF-425, Revision 3, (Rev. 3) (ADAMS Accession No. ML080280275). The *Federal Register* notice published on July 6, 2009 announced the availability of this TS improvement.

2.0 PROPOSED CHANGES

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

- Frequencies that reference other approved programs for the specific interval (such as the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program);

- Frequencies that are purely event driven (e.g., "Each time the control rod is withdrawn to the 'full out' position");

- Frequencies that are event-driven but have a time component for performing the surveillance on a onetime basis once the event occurs (e.g., "within 24 hours after thermal power reaching ≥ 95% RTP"); and

- Frequencies that are related to specific conditions (e.g., battery degradation, age, and capacity) or conditions for the performance of a surveillance requirement (e.g., "drywell to suppression chamber differential pressure decrease").

The definition of "Staggered Test Basis" in Section 1.1, "Definitions," is deleted.

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

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

reflect the changes made to the Technical Specifications and do not substantially contribute to the understanding of the implementation of the proposed Technical Specification requirements.

Various editorial changes are made to the Bases as needed to facilitate the addition of the Bases changes.

3.0 BACKGROUND

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

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

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

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

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

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

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

4.0 TECHNICAL ANALYSIS

The control of changes to the relocated Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. That Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. In addition,

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

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "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.

The referenced document, NEI 04-10, provides a detailed description of the process to be followed when considering changes to a Surveillance Frequency. NEI 04-10 has been reviewed and approved by the NRC.

Some Surveillance Frequencies are performed at a given periodicity on a STAGGERED TEST BASIS and are written similar to "18 months on a STAGGERED TEST BASIS." The phrase "on a STAGGERED TEST BASIS" is also relocated to the Surveillance Frequency Control Program and the defined term, which would no longer be used in the TS, is removed from Section 1.1. The purpose of specifying certain Surveillances to be performed on a STAGGERED TEST BASIS is to increase the reliability of the tested system by identifying common mode failures more quickly. Relocating the Frequency requirement to perform Surveillances on a STAGGERED TEST BASIS along with the periodicity allows licensees the flexibility to adjust the Frequency based on operational experience and risk assessment results.

For example, a Frequency may be extended but include a new requirement to perform the Surveillance on a STAGGERED TEST BASIS to reflect a higher risk associated with common mode failures. Conversely, a Frequency may be changed to eliminate a

requirement to perform the Surveillance on a STAGGERED TEST BASIS due to a lower risk or operational experience associated with common mode failure. NEI 04-10 contains information to support the correct risk modeling of Surveillance Frequencies with and without a requirement to perform the Surveillance on a STAGGERED TEST BASIS.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 and 1.177. Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF).

Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies. Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

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

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

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

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

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

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

a. A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation.

b. Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided.

c. System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers).

d. Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed.

e. Independence of barriers is not degraded.

f. Defenses against human errors are preserved.

g. The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

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

3. The proposed change maintains sufficient safety margins.

Conformance with this principle is assured since SSC design, operation, testing methods, and acceptance criteria specified in the Codes and Standards or alternatives approved for use by the NRC will continue to be met as described in the plant licensing basis (e.g., FSAR, or Technical Specifications Bases). Also, the safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses, etc.) are met with the proposed change.

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

NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," requires that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

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

   NEI 04-10 requires that changes in Surveillance Frequencies be monitored using performance management strategies.

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

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration Determination

PPL has reviewed the proposed no significant hazards consideration determination (NSHC) published in the *Federal Register* July 6, 2009 (74 FR 31996 -32006). PPL has concluded that the proposed NSHC presented in the *Federal Register* notice is applicable to Susquehanna Steam Electric Station Units 1 and 2 and is provided below.

Description of Amendment Request: The change requests the adoption of an approved change to the standard technical specifications (STS) for General Electric Plants, BWR/4 (NUREG-1433), to allow relocation of specific TS surveillance frequencies to a licensee-controlled program. The proposed change is described in Technical Specification Task Force (TSTF) Traveler, TSTF-425, Revision 3 (Rev. 3) (ADAMS Accession No. ML080280275) related to the Relocation of Surveillance Frequencies to Licensee Control--RITSTF Initiative 5b and was described in the Notice of Availability published in the *Federal Register* on July 6, 2009 (74 FR 31996 -32006).

The proposed changes are consistent with NRC-approved Industry/Technical Specification Task Force (TSTF) Traveler, TSTF-425, Rev. 3, "Relocate Surveillance Frequencies to Licensee Control--RITSTF Initiative 5b." The proposed change relocates surveillance frequencies to a licensee-controlled program, the SFCP. This change is applicable to licensees using probabilistic risk guidelines contained in NRC-approved NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-

Informed Method for Control of Surveillance Frequencies," (ADAMS Accession No. 071360456).

Basis for proposed no significant hazards consideration: As required by 10 CFR 50.91(a), the PPL analysis of the issue of no significant hazards consideration is presented below:

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

Response: No.

The proposed change relocates the specified frequencies for periodic surveillance requirements to licensee control under a new Surveillance Frequency Control Program. Surveillance frequencies are not an initiator to any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The systems and components required by the technical specifications for which the surveillance frequencies are relocated are still required to be operable, meet the acceptance criteria for the surveillance requirements, and be capable of performing any mitigation function assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any previously evaluated?

Response: No.

No new or different accidents result from utilizing the proposed change. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any new or different requirements. The changes do not alter assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions and current plant operating practice.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The design, operation, testing methods, and acceptance criteria for systems, structures, and components (SSCs), specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plant licensing basis (including the final safety analysis report and bases to TS), since these are not affected by changes to the surveillance frequencies. Similarly, there is no impact to safety analysis acceptance criteria as described in the plant licensing basis. To evaluate a change in the relocated surveillance frequency, PPL will perform a risk evaluation using the guidance contained in NRC approved NEI 04-10, Rev. 1 in accordance with the TS SFCP. NEI 04-10, Rev. 1, methodology provides reasonable acceptance guidelines and methods for evaluating the risk increase of proposed changes to surveillance frequencies consistent with Regulatory Guide 1.177.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, PPL concludes that the requested change does not involve a significant hazards consideration as set forth in 10 CFR 50.92(c), Issuance of Amendment.

5.2 Applicable Regulatory Requirements/Criteria

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

The proposed change is consistent with other Surveillance Frequencies in the ISTS. In several instances, the ISTS do not specify a particular

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

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

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

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

7.0 REFERENCES

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

7.2. Regulatory Guide 1.174, Revision 1, "An Approach for using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis," November 2002.

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

Attachment 2 to PLA-7119

Documentation of PRA Technical Adequacy

SUSQUEHANNA PRA TECHNICAL ADEQUACY ASSESSMENT

TABLE OF CONTENTS

1.0 OVERVIEW

The implementation of the Surveillance Frequency Control Program (also referred to as Tech Spec Initiative 5b) at Susquehanna will follow the guidance provided in NEI 04-10, Revision 1 [Ref. 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.

- Review each candidate STI revision to determine whether there are any NRC or other commitments that may prohibit changing the interval. If there are no related commitments, or if it is determined that the commitments may be changed using an approved commitment change process, then evaluation of the candidate STI revision may proceed. If a commitment exists and the commitment change process does not permit the change, then the candidate STI revision may not be implemented.
- Perform a qualitative analysis that involves applicable considerations as explained in NEI 04-10, Revision 1.
- Perform a risk assessment in accordance with NEI 04-10. When possible use the Probabilistic Risk Assessment (PRA) to quantify the effect of the candidate STI revision. The results are compared to the acceptance criteria in NEI 04-10. Also, the cumulative impact of all risk-informed STI revisions is compared to the acceptance criteria in NEI 04-10. 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 determine if justification for the acceptability of the proposed test interval change can be provided.
- Conduct an Integrated Decision Making Panel (IDP) review. The IDP is an expert panel consisting of the Maintenance Rule Expert Panel with the addition of specialists with experience in surveillance tests and system or component reliability. The STI revision may be implemented with IDP approval.

- Performance monitoring is conducted as recommended by the IDP. The performance monitoring is intended to identify if the STI revision results in unintentional degraded reliability. In some cases no additional monitoring may be necessary beyond that already conducted under the Maintenance Rule.
- The IDP conducts periodic reviews of the performance monitoring results. If it is determined that a STI extended under this process is a factor in unsatisfactory surveillance results, the IDP returns the STI back to the previous STI.

The NEI 04-10 methodology endorses the guidance provided in Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," [Ref. 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
   - Address the need for the PRA model to represent the as-built, as-operated plant.
   - Identify permanent plant changes (physical or operational practices) that have an impact on the PRA but have not been incorporated in the baseline PRA model.
   - Identify key assumptions and approximations relevant to the results used in the decision-making process.

- Document that the parts of the PRA required to produce the results used in the decision are performed consistently with the ASME/ANS PRA standard [Ref. 3] as endorsed in the appendices of Regulatory Guide 1.200. This includes the identification of the use of parts to the PRA that conform to capability categories lower than deemed required for a given application.
- Document additional peer review facts 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.

Because of the broad scope of potential Initiative 5b applications and the fact that the parts and scope of the PRA 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 report is to address the requirements identified in item 4 above. An overview of the planned approach for addressing external events and shutdown risk is also provided.

2.0 PRA TECHNICAL ADEQUACY

This portion of the assessment addresses the items identified in RG-1.200 to demonstrate the technical adequacy of the PRA. This includes the following items:

- PRA represents the as-built, as operated plant
- Permanent plant changes not incorporated in the PRA
- Identification of key assumptions and approximations
- Identification of parts of PRA not meeting Capability Category II
- Additional peer review facts and observations

Each of these items is discussed in turn.

2.1 PRA REPRESENTS THE AS-BUILT, AS-OPERATED PLANT

The JUL12R1 update to the Susquehanna PRA model is the most recent evaluation of the risk profile at Susquehanna for internal event challenges [Ref. 10]. The Susquehanna PRA model 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 Susquehanna PRA is based on the event tree/fault tree methodology, which is a well-known methodology in the

industry. PPL employs a structured approach to establishing and maintaining the technical adequacy and plant fidelity of the PRA model for both Susquehanna operating units. 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 Susquehanna PRA.

PRA Maintenance and Update

The PPL PRA maintenance and update process ensures that the applicable PRA model remains an accurate reflection of the as-built and as-operated plants. This process is defined in PPL administrative procedure NDAP-QA-1002 [Ref. 9] and a subordinate implementing procedure. PPL procedure NFP-QA-201, "Internal Events At Power PRA Model Update and Configuration Control Process," delineates the responsibilities and guidelines for updating the full power internal events PRA model for Susquehanna Units 1 and 2 [Ref. 8]. The overall model update process, including NFP-QA-201, 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 assessed.
- Plant specific initiating event frequencies, failure rates, and maintenance unavailabilities are updated at least every 6 years.

In accordance with this guidance, regularly scheduled PRA model updates occur at least every six years with more frequent updates occurring based on the risk significance of permanent changes, initiating events, and failure data such that the PRA continues to adequately represent the as-built, as-operated plant.

PPL implemented the JUL12R1 update to the Susquehanna PRA in January 2014. This update incorporated resolution of comments received from the industry peer review of the Susquehanna PRA conducted in October 2012.

2.2 PERMANENT PLANT CHANGES NOT INCORPORATED IN THE PRA

PPL's PRA maintenance and update process requires permanent plant changes to be assessed for model impacts. A risk model impact evaluation (RMIE) is created for all issues that are identified that could impact the PRA model. Each RMIE and assessment is tracked in the RMIE database. As of this submittal, there are no modifications or procedure changes which will require a PRA change. As part of the PRA evaluation for each STI change request, a review of open items in the RMIE database will be performed and an assessment of the impact on the results of the application will be made prior to presenting the results of the risk analysis to the IDP. If a non-trivial impact is expected, then this may include performance of additional sensitivity studies or model changes to confirm the impact on the risk analysis.

2.3 IDENTIFICATION OF KEY ASSUMPTIONS AND APPROXIMATIONS

The overall Initiative 5b process is a risk-informed process with the PRA model results providing one of the inputs 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 NEI 04-10 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 for each STI change assessment will be documented and included in the results of the risk analysis submitted to the IDP. These additional sensitivity studies are identified through a review of identified gaps to Capability Category II as required by NEI 04-10, Steps 5 and 14, and a review of the sources of uncertainty identified in the PRA model quantification summary notebook [Ref. 10].

2.4 IDENTIFICATION OF PARTS OF PRA NOT MEETING CAPABILITY CATEGORY II

PPL has had PRA Peer Reviews performed in 2003 and in 2012. The 2012 peer review was performed in October 2012 using the NEI 05-04 process, the ASME PRA Standard (ASME/ANS RA-Sa-2009), and Regulatory Guide 1.200, Revision 2. The 2012 Susquehanna PRA Peer Review was a full-scope review of the technical elements of the internal events and internal flooding, at-power PRA.

The 2012 peer review resulted in 284 (89%) Supporting Requirements (SRs) meeting Capability Category II or higher, and 35 (11%) of the SRs not meeting Capability Category (CC) II or higher. Note that of the 35 SRs not meeting CC II

or higher, 24 were associated with the internal flooding technical element. Therefore, excluding internal flooding, more than 95% of the SRs met CC II or higher. Table 1 lists all the SRs that do not meet CC II or higher and lists the SR, F&O gap with Significance, Resolution, and PRA Model Impact.

PRA Impact from Internal Events

The peer review model and documentation were revised as described in the "Resolution" column. The revised model has been renamed JUL12R1 [Ref. 10]. Upon completion of the JUL12R1 model, excluding the internal flooding SRs, there are only 4 open item SRs, that do not meet CC II or higher. These SRs are HR-C3, DA-C6, DA-C12, and DA-C13. As noted in Table 1, these SRs have been evaluated and determined to be documentation enhancements and/or have negligible effect on the technical aspects or quantification of the risk model.

Additionally, it is noteworthy that there were ten best practices provided by the peer review team indicating the high level of quality of the Susquehanna PRA model.

PRA Impact from Internal Flooding

As noted in Table 1, several of the internal flooding SRs did not meet Category II requirements. However, internal flooding is not a significant contributor to CDF and LERF for Susquehanna. The PRA Quantification Summary Notebook [Ref. 10] lists internal flooding as contributing 4.6% to CDF and 1.9% to LERF and provides a comparison to Limerick Generating Station. Limerick is a very similar two-unit plant design but with the following notable hardware and operational differences.

- Limerick has four EDGs per unit whereas Susquehanna has four shared EDGs.
- Susquehanna has a spare 'E' EDG and also maintains the Blue Max portable DG.
- Limerick has procedural direction to cross-tie the 4 kV buses to get power from available EDGs to the safeguard buses as needed.
- Susquehanna does not inhibit ADS in non-ATWS scenarios whereas Limerick does direct inhibiting ADS in non-ATWS scenarios (both sites direct inhibiting ADS in ATWS scenarios).
- ECCS pump cooling and ECCS room cooling are normally supplied by SW at Limerick with backup provided by ESW. ECCS pump and room cooling is only provided by ESW at Susquehanna.

Other than the major differences highlighted above, the sites are very similar. The two sites are dual unit sites and have General Electric BWR/4 reactors. Bechtel was the architect engineer for both sites and the two sites are similar architecturally. Therefore, with the plant layouts being similar, similar internal flooding results can be expected. Limerick's flooding contribution to CDF and LERF as 5.9% and 3.6% respectively, which is comparable to Susquehanna's flooding contribution. It should also be noted that Limerick had only a few flooding SRs not meeting Capability Category II [Ref. 11]. Based on this industry comparison and small contribution of internal flooding to overall CDF and LERF, the Susquehanna internal flooding PRA can be applied to support the STI frequency change program. While the JUL12R1 PRA model supports this application, PPL is addressing the internal flooding F&Os through a focused model update.

2.5 ADDITIONAL PEER REVIEW FACTS AND OBSERVATIONS

Table 2 lists all the SRs meeting CC II or higher for which an F&O was written. Similar to Table 1, it also lists the SR, F&O gap with Significance, Resolution, and PRA Model Impact. As can be seen, all of the remaining facts and observations have been closed, or have otherwise been determined to have no or negligible impact on the PRA model results.

3.0 EVALUATION OF CHANGES FOR EXTERNAL EVENTS AND SHUTDOWN

The SSES PRA is a Level 1 and 2 model that includes internal events and internal floods. For external events such as fire, seismic, and other external events, the risk assessments from the IPEEE [4] can be used for insights on changes to surveillance intervals. The status of available information for external events (internal fires, seismic, and other external hazards) as well as shutdown risk is provided below. The proposed use of this information in the context of the surveillance frequency change evaluations is then also provided.

3.1 INTERNAL FIRES

The SSES plant risk due to internal fires was evaluated in 1994 as part of the SSES Individual Plant Examination for External Events (IPEEE) submittal [4]. The results were amended based on the NRC audit of the IPEEE. PPL document PLA-4983 [5] summarizes the results of the audit on the fire analysis in addition to the updated conclusions of the seismic analysis.

The SSES fire analysis was performed using the methodology prescribed in the PRA Procedures Guide [6], which produced results similar to those yielded by the IPE internal events analysis. While the fire analysis did yield a CDF, the intent of the analysis was to identify the most risk significant fire areas in the plant using a screening process and by calculating conservative core damage frequencies for fire scenarios. Additionally, the analysis at the time was based on PRA modeling techniques that have since been upgraded to more acceptable standards. As such, the accident sequence frequencies calculated for the SSES fire PRA are not a best estimate calculation of plant fire risk and are not acceptable for integration with the best estimate SSES internal events PRA results.

In summary, the use of the available fire risk information from the IPEEE is limited, but the NEI 04-10 methodology allows a qualitative screening or bounding analysis to provide justification for acceptability of proposed surveillance frequency changes as described in Section 3.5 below.

3.2 SEISMIC RISK

The SSES seismic risk analysis was performed as part of the IPEEE [4]. SSES performed a seismic margins assessment (SMA) following the guidance of EPRI NP-6041 [7]. The SMA is a deterministic evaluation process that does not calculate risk on a probabilistic basis. No core damage frequency sequences were quantified as part of the seismic risk evaluation.

The final results of the seismic analysis are documented in the SSES response to audit issues on the IPEEE submittal [5]. While many of the same results were provided in the IPEEE submittal, the SSES Response to Audit Issues provides a more complete description of the actions taken by PPL to close out the seismic related issues at the site.

3.3 OTHER EXTERNAL EVENTS RISK

In addition to internal fires and seismic events, the SSES IPEEE Submittal analyzed a variety of other external hazards:

- High Winds/Tornadoes
- External Floods
- Transportation and Nearby Facility Accidents

The SSES IPEEE analysis of high winds, tornadoes, external floods, transportation accidents, and nearby facility accidents was accomplished by reviewing the plant environs against regulatory requirements regarding these hazards. Based upon this review, it was concluded that SSES meets the applicable NRC Standard Review

Plan requirements and therefore has an acceptably low risk with respect to these hazards.

3.4 SHUTDOWN RISK

SSES does not maintain a shutdown PRA model. Consistent with the NEI 04-10, Revision 1 guidance, qualitative information must be developed that supports the acceptability of the STI change with respect to the shutdown risk or it must be screened as not having an impact on the CDF and LERF metrics.

3.5 SURVEILLANCE FREQUENCY CHANGE EVALUATIONS

PPL is committed to evaluating changes to surveillance frequencies in accordance with the guidance provided in NEI 04-10, Revision 1. The NEI 04-10 methodology allows a qualitative screening or bounding analysis to provide justification for acceptability of proposed surveillance frequency changes. Since the SSES PRA model does not currently include shutdown conditions, internal fires, and other external events, the NEI 04-10 guidance will be used to evaluate the potential risk impact of shutdown conditions and external events associated with the surveillance frequency changes. Specifically, external event information from the SSES IPEEE report will be reviewed and qualitatively assessed based on engineering judgment to determine the impact of the external events on proposed surveillance frequency changes. If the qualitative information is deemed not to be sufficient then a bounding analysis will be performed.

PPL will perform bounding analysis in accordance with Step 10b, Bounding Analysis (below 1E-07/yr CDF and 1E-08/yr LERF), of NEI 04-10 Revision 1, which states, in part:

> If the ΔCDF and ΔLERF values have been demonstrated to be very small from an internal events perspective based on detailed analysis of the impact of the SSC being evaluated for the STI change, and if it is known that the CDF or LERF impact from external events (or shutdown events as applicable) is not specifically sensitive to the SSC being evaluated (by qualitative reasoning), then the detailed internal events evaluations and associated required sensitivity cases can be used to bound the potential impact from external events and shutdown PRA model contributors. As another example, if the ΔCDF and ΔLERF values have been demonstrated to be very small from an internal events perspective based on detailed analysis of the impact of the SSC being evaluated for the STI change, and if it is known that the plant CDF and LERF results of the external event or shutdown PRA are much smaller than the corresponding values for the internal event full power PRA, (that is, less than 10%), then the results of the internal events analysis alone would suffice for the STI consideration.

This example is likely to be applicable for a situation where the SSC associated with the STI change is modeled in the internal event full power PRA, but not in the external event or shutdown PRA.

Information regarding the external events and shutdown risk impacts will be summarized in the documented PRA assessments for each STI change and provided to the IDP.

4.0 SUMMARY

The Susquehanna 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.

5.0 REFERENCES

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

[2] Regulatory Guide 1.200, *An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk Informed Activities*, Revision 2, March 2009.

[3] American Society of Mechanical Engineers, *Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications*, (ASME RA-Sa-2009), Addenda to ASME/ANS RA-S-2008, Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications, February 2009.

[4] PPL (Pennsylvania Power and Light), *Susquehanna Steam Electric Station Individual Plant Examination for External Events*, June 1994.

[5] PPL (Pennsylvania Power and Light), *Susquehanna Steam Electric Station Response to Audit Issues on IPEEE Submittal Units 1 and 2*, PLA-4983, October 1998.

[6] Hickman, J. W., et al., *PRA Procedures Guide*, NUREG/CR-2300, January 1983.

[7] EPRI (Electric Power Research Institute), *A Methodology for Assessment of Nuclear Power Plant Seismic Margin*, EPRI NP-6041 Revision 1, August 1991.

[8] NFP-QA-201, "Internal Events at Power PRA Model Update and Configuration Control Process," Rev. 0.

[9] NDAP-QA-1002, "Maintenance and Update of the Susquehanna PRA," Rev. 1.

[10] EC-RISK-1164, Rev. 0, "Summary Notebook for the JUL12R1 PRA Model."

[11] Limerick Generating Station Units 1 and 2, License Amendment Request Supplemental Information, Proposed Changes to Technical Specifications Sections 3.5.1, 3.6.2.3, 3.7.1.1, 3.7.1.2, and 3.8.1.1 to Extend Allowed Outage Times, ML101670319, June 16, 2010.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IE-A5 **(Met Cat I)**	4-4: It appears that some maintenance rule systems may need to be evaluated in order to complete the systematic evaluation of each system, including support systems, to assess the possibility of an initiating event occurring due to a failure of the system. This is a finding because the SR requires that all systems must be evaluated. The requirement is to perform a systematic evaluation of EACH system, including support systems, to assess the possibility of an initiating event occurring due to a failure of the system. Not all maintenance rule plant systems appear to be identified as having been evaluated.	Each system had been evaluated but the documentation was not specifically included. Therefore, a Maintenance Rule System Table and Initiating Event evaluation was provided in new Section 2.8 of the IE Notebook	None, gap has been closed for the JUL12R1 model.
IE-A5 **(Met Cat I)**	6-29: A systematic approach to identify initiating events is documented in Section 2.4-5 and appears to be reasonably complete. However, no discussion on the effects of a loss of a single 13.8/4.16kv transformer was found in the initiating events notebook. Refer to Section 2.4 of the IE Notebook for systems reviewed. It appears that some maintenance rule systems may need to be evaluated and therefore it does not meet CCII. However, a qualitative evaluation was performed to determine the systems that cause initiating events, but some systems were not explicitly addressed. This is a suggestion as discussions with Susquehanna PRA staff indicate that loss of a trnaformer would not result in a plant trip or need for a shutdown.	Additional discussion about loss of 13.8 and 4 kV transformers was added to Section 2.4.5 of the IE Notebook to address this F&O.	None, gap has been closed for the JUL12R1 model.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
SC-A5 (Not Met)	1-12: There was no evidence presented that would indicate that an evaluation was performed to determine if certain accident sequences should be extended beyond 24 hours. Such an evaluation should include: A) Instances where there will be an eventual depletion of finite inventory injection sources (RWST/CST). B) Justification for why room cooling dependencies are not necessary for cases where room temperatures will exceed equipment functionality or isolation temperatures after 24 hours. C) Justification for not extending the mission times for systems that are required to support long term DHR beyond the 24 hour mark. This is a finding because the SR is considered to be not met.	To address this F&O, a new section 2.1.17 was added to the event tree and success criteria notebookoutlining the dominant considerations contributing to the 24 hour PRA mission time. The section also outlines those systems/equipment with less than a 24 hour mission time.	None, gap has been closed for the JUL12R1 model.
SC-A5 (Not Met)	1-23: The EDG mission time is 24 hours. This is conservative compared to many plants which use the convolution integral method to justify a much shorter mission time. This is helpful for the improvement of MSPI margin. This is a suggestion because it is a modeling enhancement.	Open item	This open item is a provided suggestion for possible enhancement and does not by itself result in SC-A5 not being met. Therefore, there is no model impact

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
SC-A5 **(Not Met)**	1-24: Since the failure to start and run for 1st hour have been combined in the data, the fail to run events with a mission time of 24 hours actually give the PRA a mission time of 25 hours. The treatment is conservative and adds a very small increase in the failure probability, so it is presented as a suggestion.	Per the peer review team proposed resolution, the existing data was reviewed. It was determined and documented in the Component Data Notebookthat the use of 24 hours for the failure to run portion is slightly conservative and acceptable. Therefore, the total time represented is one hour for failure to start, and 24 hours for failure to run.	Negligible as the model is slightly conservative as is. The gap has been closed for the JUL12R1 model

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
SY-C3 **(Not Met)** <u>Related SRs</u> QU-E1 (Met Cat I/II/III) AS-C3 (Met Cat I/II/III) DA-E3 (Met Cat I/II/III) HR-I3 (Met Cat I/II/III) LE-F3 (Met Cat I/II/III) IE-D3 (Met Cat I/II/III) SC-C3 (Met Cat I/II/III)	1-18: Plant specific sources of modeling uncertainty are also addressed in the Summary Notebook Appendix D. However, there are only 4 candidate sources of uncertainty identified. Given the large number of modeling assumptions in the system notebooks (28 in the RHR system notebook alone) a more thorough evaluation of plant specific sources of uncertainty should be performed. This is a finding because it relates directly to a standard requirement.	All of the system notebook assumptions were reviewed for applicability as potential sources of model uncertainty. The large majority of the listed assumptions were determined to be standard assumptions or fell under the umbrella of level of detail issues. The few remaining items were added to Table D-2 in Appendix D of the Summary Notebook for further discussion.	None, gap has been closed for the JUL12R1 model.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
HR-B2 **(Not Met)**	7-4: Table F-1 in Attachment F lists identified pre-initiator HEP basic events which include CCF basic events. However, section 4.1.2.1 of the Human Reliability Notebook, Systems Review, says that due to staggered testing/maintenance practices, like components in different divisions are generally not susceptible to restoration error and "common mode" errors are screened. Common mode errors cannot be screened in this manner. Typically a plant's work planning process that prohibits cross divisional maintenance during normal operations are typically not in effect during plant shutdowns. The modeling of pre-initiator HFEs needs to include activities that occur during plant shutdowns. This is a finding because it is desired to not screen errors that can affect multiple trains of a redundant system or diverse systems.	This item was determined to be a documentation and terminology issue and the manner that SR HR-A3 redundant systems was treated in the HRA notebook, specifically the systems review in section 4.1.2.1. After further review, SR HR-A3 identifies that only single activities that simultaneously disable redundant trains or diverse systems require the development of events. Separate procedures/maintenance acts on different divisions or systems (even if they are performed in an outage) are NOT required in the development of events. The statement "Due to staggered testing/maintenance practices, like components in different divisions are generally not susceptible to restoration errors and 'common mode' errors are screened" is no longer applicable and was removed from the HRA notebook. Therefore, the potential condition described in the peer review comment is no longer applicable.	None, gap has been closed for the JUL12R1 model.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
HR-C3 **(Not Met)**	7-1: Section 4.1.2.1 of the HRA Notebook provides guidance towards the identification of restoration errors and miscalibration errors. In the subsection for Identification of Miscalibration Errors, Item 4 says: Identify I&C components the miscalibration of which will impact redundant system trains or redundant system components. Miscalibrations that impact a single component may be screened from further consideration. The Susquehanna HRA analysis assumes that miscalibration is included in the component failure rate data. However miscalibrations are not included in the failure rate data of NUREG-6928 and therefore there are potential failures that may have an adverse impact on equipment that has not been assessed in the Susquehanna HRA. Further in Section 4.1.4 of NUREG-1792, Good Practices for Implementing Human Reliability Analysis (HRA) it says: In practice it is best to include pre-initiator human actions even if the associated failure already may be included in the failure data for the affected equipment item (e.g., in the failure-to-start data). This is because it is often hard to determine if the failure databases include such human failures since data bases are typically insufficiently documented to know if the potential pre-initiator failure is already included. Generally, unless the failure can affect multiple equipment items, either missing the failure or double-counting the failure have small effects on the outcome of the PRA. Potential double-counting is the most conservative approach and yet typically does not result in a serious overestimation of the failure's significance. In addition, including all identified pre-initiators gives analysts the opportunity to identify the significance of potentially problematic actions such as those with procedural or training problems, those that do not require appropriate checks, etc. This is a finding. The impacts of miscalibration must be included as a mode of failure of initiation of standby systems and cannot be screened.	Open item As indicated in the finding discussion from NUREG-1792, "Generally, unless the failure can effect multiple items, either missing the failure or double-counting the failure have small effects on the outcome of the PRA." Therefore, adding this level of detail for single component miscalibration events is not warranted. The HRA documentation clarifies that these events are not included because they are low contributors. When this issue is fully addressed, it may be possible to use SR SY-A15 to demonstration that single sensor miscalibrations can be excluded.	Negligible effect on model results as per the provided resolution.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
HR-F1 **(Not Met)** <u>Related SRs</u> HR-G3 (Met Cat II & III)	1-2: There are few HRA events that are grouped together into a single HFE. However, the most risk significant example is MANOP_SPC_INJ_L-O. This event represents the opening of several valves related to the SPC function. The degree of difficulty of opening these valves is not necessarily the same nor are the performance shaping factors. There is little documentation in the HRA documentation or HRA calculator to justify this grouping. Also, the value for this HRA grouping appears to be extremely low for an in-field operator action 6.9E-4). This is a finding because this issue causes the SR HR-F1 to be 'Not Met.'	Redefined the risk significant MAN-OP_SPC_INJ_L-O into three new HEPs MAN-OP_SPC_E-O, MAN-OP_SPC_L-O, and MAN-OP_INJ_L-O, and performed detailed evaluations for each.	None, gap has been closed for the JUL12R1 model.
HR-F1 **(Not Met)**	1-3: For HRA MAN-OP_SPC_INJ_L-O, there is no analysis of how many "turns" that it takes to manually operate the valves that are to be operated. The valves within this grouped HEP are within large diameter piping segments with varying diameters and stroke characteristics. These characteristics can significantly affect the manipulation time. This is a finding, since it directly involves the manipulation time evaluation of a risk significant operator action.	Detailed timing evaluation added as part of the evaluation of the new HEPs MAN-OP_SPC_E-O, MAN-OP_SPC_L-O, and MAN-OP_INJ_L-O. References were added to the Timing and Assumptions sections of the three MAN-OP calculations in the HRA notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
HR-G6 **(Not Met)**	7-9: While Table 5.1-2 does lists the actions by decreasing HEP value and includes comparison comments execution location, execution stress, performance shaping factors, timing information, the comparison comments are really directed more towards an internal assessment of the HFE itself, rather than it's comparison between events that have a similar HEP. However, the standard requires that a check of HEP values relative to each other be performed. It does not appear that this was done. This is evidenced by the fact that there are some local actions (with potentially negative performance shaping factors and lower likelihood of success) that have HEP values roughly equal to those of a similar in control room action. Examples of this include 159-CNTVNT-O and 159-CNTVNTLOCAL-O, as well as MAN-OP_SPC_INJ_L-O compared to other control room actions). Further, there is no discussion to relate location; timing, PSFs, etc. relative to each other and the values within a HFE range are highly variable. It is understood that the intent of this standard is to assess the HFEs relative to each other, i.e., for all of the HFEs that fall within a specific range, is the expected failure rate of the operators considered reasonable? For example, are all of the events that have a 1E-1 probability considered more difficult than the HFEs that have probabilities in the 1E-2 range? Similarly all of the HFE's that have probabilities on the 1E-3 range should be generally considered to have the same level of difficulties compared to the ones in the 1E-2 range. This is a finding because it is not apparent a comparison of events of like values, i.e., those with similar HEPs, has been conducted.	Added text to Section 5.1 to explain that the Table 5.1-2 actions were listed (along with their individual details) in decreasing HEP order in order to facilitate comparison between actions with similar HEPs. Inconsistencies were identified and corrected as needed. There are some local actions, as noted by the reviewer, with potentially negative performance shaping factors that have HEP values roughly equal to those of control room actions, but the similarity is justified in the comments section by stating that the time available for recovery for the ex-MCR action would allow multiple execution attempts and recovery opportunities.	None, gap has been closed for the JUL12R1 model.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
DA-C6 **(Not Met)** <u>Related SRs</u> DA-C7 (Cat II/III met)	4-9: As shown in Attachment B and Tables B-8 and B-9 of the Component Data Notebook, most estimated demands were determined from the MSPI and from plant experience. However, there is no documentation that it is collected in accordance with the requirements of this SR. This is a finding. The basis for collection of plant failure data is not provided except to indicate that the source was from MSPI data.	Open item	Negligible effect on model results. This F&O cites a lack of documentation that the estimated demands were collected in accordance with the SR.
DA-C12 **(Not Met)** **DA-C13** **(Not Met)**	4-12: No evidence was found that the unavailability data obtained from MSPI was evaluated for issues of "double counting". Also, there was no consideration given to the handling of unavailability hours that occurred online versus during an outage. This is a finding because there was no evidence found that this requirement was considered.	Open item	Documentation item. Negligible effect on model results. MSPI unavailabilty data is by it's own program considered for reactor 'critical' hours. Unkown potential 'double counting' of MSPI data would be slightly conservative.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
QU-D4 **(Met Cat I)** <u>Related SRs</u> LE-F2 (Met Cat I/II/III)	5-7: No evidence of a comparison of CDF and LERF results with similar plants was found in the documentation. CC-II requires this comparison and identification of causes for significant differences. This is a finding because it causes QU-D4 to be a Cat I.	Attachment F was added to the quantification and summary notebook which includes a detailed comparison of the CDF and LERF results with Limerick. Limerick has been considered a sister plant to Susquehanna and is a very similar two unit BWR GE design site. The comparison results were similar and reasonable.	None, gap has been closed for the JUL12R1 model.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSO-A1 **(Not Met)** **IFSN-A16** **(Not Met)** <u>Related SRs</u> IFSO-A3 (Not Met) IFSN-A10 (Not Met) IFSN-A14 (Not Met) IFSN-A15 (Not Met) IFQU-A5 (Not Met) IFQU-B3 (Not Met)	6-2: Per discussion in Section B.2.1, a rupture of fire protection piping appears to be screened from further analysis, except in a few select areas. The given basis for this is that a fire protection rupture would be quickly identified, diagnosed, and isolated. However, it may not be an insignificant amount of time for operations to diagnose that a flood is occurring, rather than a fire. Once the flood condition is identified, it may take further time to isolate the flood (typically not able to simply stop the pump in the control room, but rather it must be shut down locally). It is possible for a significant amount of flooding to occur during this time period. While some flood scenarios are included in the analysis, it is unclear what criteria was used as to whether or not fire protection piping was excluded in a given area, and how much total fire protection piping was excluded. This is a finding because fire protection piping does not appear to be adequately addressed in the analysis. Floods resulting from fire protection piping ruptures can be significant contributors to CDF.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSO-A1 (Not Met)	6-3: Section 2.2.11 indicates that lagged and insulted piping was not considered as a spray source. There does not appear to be any justification for this assumption, and it is typically not used for industry IFPRAs. Furthermore, it is unclear from the documentation if spray effects from fire piping is included or not, based on the discussions in Section B.2.1 about excluding fire piping. Based on discussions with site and contractor personnel, a calculation was produced to demonstrate that lagged piping could not result in a spray impact. Furthermore, there are very few, if any, cases of insulated piping that is not also lagged. Finally, it was confirmed that fire protection piping was considered as a spray source. This is a suggestion to enhance the documentation.	Open item	Documentation item. No impact
IFSO-A1 (Not Met)	6-4: Flood sources appear to be based on building elevations rather than individual flood areas. This is a finding as this SR requires flood sources to be identified on a flood area basis.	Open item.	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSO-A1 **(Not Met)** <u>Related SRs</u> IFSN-A8 (Met Cat II)	1-35: There is no evidence that a search for sources of flooding on the upper level of the control structure (where chiller units and service water piping is located) which could cause flooding of the control room, battery rooms, and/or relay rooms via propagation through ductwork was considered in the analysis. Susquehanna personnel looked at drawings during the Peer Review and found no evidence of such a scenario. However, this should be confirmed by a walkdown. This is a suggestion, since there is no evidence based upon Susquehanna evaluation during the Peer Review that this is a plausible scenario.	Open item. An interim walkdown was performed in and around the class 1E battery and DC distribution panel areas in the Control Structure. No ductwork was located in the immediate vicintiy of class 1E batteries, chargers, or distribution panels such that direct spray or deluge would cause inoperability.	Documentation item. No impact The identified gap is a suggestion to provide additonal documentation supporting the investigations perfromed during the peer review and additional walkdown.
IFSO-A1 **(Not Met)** **IFSO-A3** **(Not Met)** **IFSN-A15** **(Not Met)** <u>Related SRs</u> IFSN-A10 (Not Met)	6-41: Section 3.4 of the Internal Flooding notebook indicates that only >6 in (and in some cases >4 in) piping was considered for flood scenarios, and it appears that smaller diameter piping (in general) was not considered. Flood scenarios have been developed and are listed in Appendix C, and in Table 4-1 of Attachment E, of the Internal Flooding notebook. However, given the number of inappropriately screened flood sources, a significant number of potential flood scenarios have likely been missed in this analysis. This is a finding as potential flood sources may have been missed or not appropriately assessed, which causes several SRs to be "Not Met."	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSO-A4 **(Not Met)**	6-5: Failure modes of components appears to be included in the pipe rupture data used, as discussed in Section 2.2.9 of the Internal Flooding Notebook. Maintenance events are also assumed to be captured in this data (see also discussion in Section 3.7 of Attachment E). Inadvertent actuation of fire suppression system is discussed in Section B.2. While a review of industry OE was performed for maintenance induced flooding, no plant-specific review is documented. Furthermore, no review of plant test and maintenance procedures to identify potential errors resulting in a flood appears to have been performed. This is a finding as the plant-specific potential for maintenance-induced flooding does not appear to be appropriately addressed.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSO-A5 **(Not Met)**	6-6: The Reg Guide 1.200 Clarification states that a range of flow rates must be considered. This analysis considers only 'worst case' failure scenarios. This is a finding as a range of flow rates is required per the Reg Guide 1.200 clarification.	Open item	Negligible effect on model results. Bounding larger break flooding effects are considered in the model. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSO-A5 **(Not Met)**	6-7: Pressure and temperature information for flood sources was not found in the documentation. This is a finding as pressure and temperature information is not included in the Internal Flooding Analysis.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSO-B3 **(Not Met)** **IFSN-B3** **(Not Met)** **IFEV-B3** **(Not Met)** **IFQU-B3** **(Not Met)** <u>Related SRs</u> IFPP-B3 (Met Cat I/II/III)	6-20: Assumptions are discussed in Section 2.2 of the Internal Flooding documentation. Discussion of uncertainty appears limited to discussion of flood initiator frequencies. Attachment D includes discussion of pipe failure modes but no other discussion of uncertainty is identified. No documentation exists for impacts of various assumptions on model uncertainty could be found. This is a finding as the SR requires a discussion of model uncertainty.	Open item	Documentation item. Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSN-A3 **(Not Met)** **IFSN-A14** **(Not Met)** **IFQU-A5** **(Not Met)**	6-9: Automatic and Operator actions appear to be identified throughout the notes in Appendix C, as well as the discussion in Section B. However, numerous concerns exist with the approach taken, as discussed below. There appears to be no justification/basis for crediting these actions. For example, a flood in C-604 (page C.2 credits operator action to isolate a domestic water pipe rupture prior to equipment damage. What indication exists to alert operations of the flood prior to the occurrence of equipment damage? Furthermore, no consideration is given to the likelihood of operator failure/in-action. This is a finding since while operator actions are credited to terminate flooding before equipment damage occurs, there appears to be insufficient basis for crediting these actions. This may result in erroneously screening some scenarios, which is non-conservative.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-A3 **(Not Met)** <u>Related SRs</u> IFQU-A5 (Not Met)	6-10: Section 4.2 states that no mitigation actions credited to limit the impacts from a flood. However, the comments contained in Appendix C do appear to credit operator action (as well as discussion in Section B.2.1 to isolate fire protection piping). This text is confusing/incorrect. This is a suggestion because it only pertains to documentation and is not an unanalyzed method.	Open item	Documentation item. No impact

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSN-A6 **(Not Met)** **IFQU-A9** **(Not Met)**	6-14: Susceptibility of SSCs to flood damage is discussed in Section 2.2 of the Internal Flood notebook. This discussion includes spray and submergence considerations. A qualitative discussion of additional impacts (jet impingement, pipe whip, humidity) is required for CC I/II per Reg Guide 1.200 clarification, but is not included here. Since medium and small bore fire protection piping is dismissed from the analysis and since spray sources greater than 10 feet away from the source are typically dismissed, the effects of pipe whip and jet impingement cannot be said to be evaluated in the quantification. This is a finding. A qualitative discussion of additional impacts (jet impingement, pipe whip, humidity) is required for CC I/II per Reg Guide 1.200 clarification to meet SR IFSN-A6. An evaluation of medium/small bore piping for pipe whip and jet impingement is required to meet SR IFQU-A9.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-A10 **(Not Met)** <u>Related SRs</u> IFSN-A5 (Met Cat I/II/III)	6-42: Flood scenarios have been developed and are listed in Appendix C, and in Table 4-1 of Attachment E, of the Internal Flooding notebook. There does not appear to be any consideration to the impact of water intrusion on control panels or junction boxes. This can result in additional failures to PRA-credited equipment that is otherwise not impacted by the flood. This is a finding as some potential failure modes (grounding of local control panels or junction boxes) were not considered in the analysis.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSN-A13 **(Not Met)**	6-17: Per Section 3.3.5 and Appendix E of the Internal Flooding documentation, flood areas were screened if no scram or 72 hour shutdown was required OR no significant source of water exists in the room. This is not sufficient per the standard. This is a finding since it causes the associated SR to be not met.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-A17 **(Not Met)** **IFQU-A11** **(Not Met)** <u>Related SRs</u> IFSO-A6 (Met Cat I/II/III) IFQU-B2 (Met Cat I/II/III)	1-40: Credited plant walkdowns were conducted at various times and were separated by a period of many years. There was not a systematic walkdown plan that was applied to this process and thus the requisite information could not be gleaned to form the basis for scenario development. Walkdowns were deemed to not be complete with respect to their evaluation of flood-induced HRA and (implicit or explicit) screening decisions. This is a finding because it causes SRs to be not met.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-A17 **(Not Met)** <u>Related SRs</u> IFSN-A12 (Met Cat I/II/III) IFSN-B1 (Met Cat I/II/III)	4-17: Qualitative screening of areas is discussed in Appendices B and C of the Internal Flood notebook. Flood areas appear to screened on the basis of either no significant flood sources or no mitigation equipment is present in the flood area. However, except for Table 4-1 for unscreened flood areas, sufficient information is not provided to determine which SSCs are in each flood area and what flood heights or spray considerations should have been included. This is a suggestion since it involves documentation. There is insufficient information provided about the SSCs in each flood area.	Open item	Documentation item. No impact

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSN-B2 **(Not Met)**	6-18: The Internal Flooding notebook discusses propagation pathways, accident mitigation features, assumptions and calculations, flood scenarios considered, screened, and retained, and results of plant walkdowns. No information was found regarding listing of SSCs in each flood area, height of floor, vulnerability to spray, etc. This is a finding as information used in the analysis is not clearly referenced to verify accuracy.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-B2 **(Not Met)** <u>Related SRs</u> IFSO-B2 (Met Cat I/II/III)	6-19: The Internal Flooding notebook discusses propagation pathways, accident mitigation features, assumptions and calculations, flood scenarios considered, screened, and retained, and results of plant walkdowns. Only limited information was found regarding pipe lengths, diameters, insulation, etc. This is a finding as piping information is required to verify the results of the assessment, including max flow rate and pipe rupture frequencies.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-B2 **(Not Met)** <u>Related SRs</u> IFSN-A2 (Met Cat I/II/III)	6-8: Presence of alarms is discussed in individual room analysis in Appendix B of Internal Flooding notebook. Curbs, drains, sump pumps, etc. appear to be accounted for in calculations in Appendix C. Appendix D lists all water tight doors in plant. Lists/tables of such features in each plant area would aid in review, as well as walkdown verification. This is a suggestion since while the required information appears to be incorporated in the analysis, including lists of such features for each flood area would be beneficial for review.	Open item	Documentation item. No impact.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFSN-B2 **(Not Met)** Related SRs IFSN-A4 (Met Cat I/II/III)	6-12: Drains/sumps are discussed throughout the documentation, but no indication of drain size or sump pump capacity was found. Drains were not credited in hydraulic calculations. The presence of drains/sumps was credited to screen out some flood scenarios with low volume sources in Appendix C. The presence of curbs appears to be included in hydraulic calculations. This is a suggestion as floor drains and sumps typically do not have a major impact on flood scenarios.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFSN-B2 **(Not Met)** Related SRs IFSN-A5 (Met Cat I/II/III)	6-13: Table 4-1 of Attachment E of the Internal Flooding notebook documents the impacted SSCs. However, it is not always clear what the impacted components are, as often times only the System (example, RBCCW or HPCI) is identified. This is a suggestion as it should not impact the results of the model.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFEV-A1 **(Not Met)**	4-14: Per Section B of Internal Flooding notebook, flood scenarios are mapped to existing plant initiators or are treated as new initiators. However, flood-induced LOCAs were not considered a credible event and were excluded from consideration LOCAs were addressed in the Initiating Events notebook. This is a finding since the potential for flood-induced LOCAs was not included.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 1

SUPPORTING REQUIREMENTS NOT MEETING CAPABILITY CATEGORY II OR GREATER

SUPPORTING REQUIREMENT	F&O #, DESCRIPTION OF GAP, AND SIGNIFICANCE	RESOLUTION	MODEL IMPACT
IFEV-A5 (Not Met)	1-42: The pipe rupture frequencies used for development of the flood initiating event frequencies did not use the latest data (published in November 2010). Since the Internal Flooding Analysis was updated in early 2012, it was expected that justification would be provided to show that not using latest industry frequency data complies with the requirements. Therefore this SR is not met. This is a finding since it causes the SR to be "Not Met."	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFEV-A6 (Met Cat I)	1-41: No consideration of material condition, water hammer, or maintenance induced flooding is included in the analysis. This is finding since it causes the SR to be of Cat I only.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFQU-A6 (Not Met)	1-30: There are some flooding events which cause flooding of areas without the potential for draining the area in greater than four hours. Therefore, this screening criterion is questionable. This is a finding because it causes the SR to be "Not Met."	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.
IFQU-A6 (Not Met)	1-31: There was no consideration given for increased stress level for both in control room actions and ex-control room actions that were are not failed by the flooding scenario. There was no adjustment of HEPs related to this finding. This is a finding because it causes the SR to be "Not Met."	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
IE-A1 **(Met Cat I/II/III)**	4-2: The Manual Shutdown initiator for 'unplanned events' was included in the model even though section 2.3.4 clearly states that 'the scope of the PSA is for at-power conditions'. This F&O is a suggestion. Planned shutdowns that do not result in failures that would cause an initiating event would not challenge plant safety and would not result in an LER. Therefore, it should not be counted as an initiating event. The current estimate is overly conservative. Unsuccessful planned shutdowns would be captured in the review of plant events, reviewed for impact and included in the initiating events modeled. The ASME Standard interpretations #5 and #6 indicate that the Manual Shutdown initiator is not included in the PRA, but should be included in transition risk or low power risk models. Interpretation 5 states; "Question: Is it a requirement to include "non-forced" manual trips which are part of the normal shutdown procedure when counting initiating events. Reply: No, a normal controlled shutdown would not present the same challenges as a trip from full power. This event is more appropriate for a transition model and outside of the scope of the standard". This position is repeated in Interpretation 6; "Question: Is it a requirement to include "forced" (e.g., technical specification 3.03 actions) or "non-forced" (e.g., manual shutdowns for refueling) when the resulting shutdown follows normal plant procedures with no off-normal conditions requiring a reactor scram? Reply: No, the risk needs to be captured in a transition risk or low power risk model, which is outside the scope of RA-Sb-2005.	At power conditions for the online PRA risk model is defined to be plant modes 1, 2, and 3. Supporting Requirement IE-A1 states to "Identify those initiating events that challenge normal plant operation and that require successful mitigation to prevent core damage using structured, systematic process for identifying initiating events that accounts for plant specific features." As described in the summary notebook, "The manual shutdowns are included in the analysis because of their frequency and because they represent changes in operating state which result in the demand on available equipment to reach a safe shutdown condition. The manual shutdowns are controlled evolutions that have different characteristics than a SCRAM challenge. The manual shutdowns generally represent a reduced challenge relative to that of a turbine trip; however, also possible is a manual shutdown resulting from equipment unavailability where accident mitigation capability has been reduced prior to the demand for the shutdown." Therefore, the peer review suggestion is noted, but no changes were made to delete manual shutdowns from the initiating events given any shutdown can on some level challenge normal plant operation.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
IE-A2 **(Met Cat I/II/III)**	1-16: The loss of control room ventilation is not considered to be an initiator in the model. The initiating events notebook states that this initiator was dismissed, but there is no detailed discussion why this was done. Upon discussion with Susquehanna personnel, it was determined that there is a basis for dismissing this initiator, but it was not documented. This is a suggestion because it is a documentation concern only.	Per discussion with the peer review evaluator, the identified condition can be resolved with additional documentation. Information regarding the Appendix R fire calculation and loss of control room ventilation was added to the Initiating Events Notebook, Section 2.4.2, to support that no new initiator is needed.	Documentation item. The gap has been closed for the JUL12R1 model.
IE-A9 **(Met Cat II)**	6-28: The process by which LER reports are searched to identify precursors needs to be documented. This is a suggestion because it involves documentation only.	Per discussion with the peer review evaluator, it was desired to have additional documentation outlining the LER review. Section 2.3.8 of the Initiating Events Notebook was expanded to provide more detail to the LER review process and whether or not the events described needed to be included in the PRA.	Documentation item. The gap has been closed for the JUL12R1 model.
IE-C3 **(Met Cat I/II/III)** <u>Related SRs</u> IE-C11 (Met Cat I/II/III)	4-3: Use of NUREG-0666 includes a generic recovery estimate. No indication of Susquehanna adjustment. Section 3.5.2 of the IE Notebook uses the credit for recovery for loss of DC bus events from NUREG-0666. This is a finding. Use of NUREG-0666 is a very old reference and a more contemporary reference (NUREG-6928) should be used.	The Initiating Events Notebook Section 3.5.2 was revised to remove credit for DC bus repair recovery. Accordingly, the initiating event frequency was also changed in Table 4-1 and in the JUL12R1 model.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
IE-C6 **(Met Cat I/II/III)**	6-21: No potential Initiating Events appear to be screened based on criteria (a) or (b). A loss of River Water intake and Loss of the Spray Pond (UHS) are screened on the basis that it would not result in an immediate plant shutdown. However, this credits operator actions to remove any debris blocking the intake structure, and states that failure of this action would result in an initiating event similar to a loss of condenser heat sink. Per discussions with PRA staff, debris/fouling/ice are unlikely (no recorded plant events), and there appear to be no common suction lines that would impact multiple systems. A loss of a 13.8 kV bus was screened on the basis that it would appear like a loss of feedwater with some impacts on service water/instrument air. The notebook then states that this IE is screened as it is assumed to be adequately included in as a turbine trip transient initiator with subsequent failure of a 13.8kV AC bus. An estimation of this IE frequency should be made to verify it conforms with the Screening Criteria given in this SR. This is a suggestion as the frequencies of the screened IEs are likely low enough to support their being screened.	The proposed resolution from the peer reviewer evaluator was to estimate the frequencies for loss of the river water intake and loss of the 13.8kV bus to confirm that they are appropriately screened out under the guidance of SR IE-C6. The screening determined that these system losses should be added to the risk model. The river water makeup discussion inthe Initiating Events Notebook, section 2.4.5 was revised. The river water makeup system is now an input to the service water initiating event fault tree. CCF screen and pump terms were also added to the model loss of service water support system initiating event fault tree and are documented in the Component Data Notebook. Also added loss of 13.8 kV buses as special initiators to the initiating event notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
IE-C8 **(Met Cat I/II/III)** Related SRs IE-D1 (Met Cat I/II/III)	4-1: Section 3.5 of the IE Notebook provides the fault tree method and results of the support system initiating events. The initiating event fault trees were developed from the mitigation fault tree. Only the Service Water tree is found in the system notebook. The support system dependencies were removed from the mitigation tree to develop the initiating event fault tree. The support system initiating event fault trees developed for loss of off-site power, loss of CIG, loss of SW, loss of IA, loss of TBCCW, and loss of RBCCW are found in the Susquehanna CAFTA fault tree under gates identified for each system. The cutset results are shown in Appendix F of the IE Notebook for each system IE. This is a finding because Appendix F states that the System IE fault trees are located in the respective system notebooks, however, this was not found to be the case for RBCCW, TBCCW, IA and CIG.	The peer review finding noted that the special initiating events fault trees described in the initiating events notebook were not located in the referenced individual system notebooks. The peer review finding specifically questions the documentation of the special initiating events fault trees since the frequency is calculated within the model. The special initiating event fault trees have been added directly to the Initiating Events Notebook in Appendix F.	None, gap has been closed for the JUL12R1 model.
IE-C14 **(Met Cat I/II)**	6-25: Appendix H of the Initiating Events notebook addresses the ISLOCA frequency calculation and appears to address most of the items required by this SR. However, no discussion of interlocks of relevant surveillance tests and procedures was found. This is a finding. Consideration of protective interlocks and plant surveillance procedures is required by this SR.	Per the referenced possible resolution, Appendix H of the Initiating Events Notebook was updated to address the identified gap. A discussion of surveillances and interlocks has been added to Appendix H for ISLOCAs.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
IE-D3 **(Met Cat I/II/III)**	6-26: Assumptions are discussed throughout the IE notebook. Sources of Uncertainty regarding initiating events are included in the discussion in Section D.1.4 of the Summary Notebook. A single section/list of all assumptions made was not found, such a list may be beneficial. This is a suggestion as all assumptions made appear to be captured throughout the documentation.	Open item	Documentation item. No impact.
AS-A9 **(Met Cat III)**	2-1: Section 2.1.16 of Event Tree / Success Criteria Notebook, Thermal-Hydraulic Code Limitations, states that MAAP4 does not calculate peak fuel temperature well. However, fuel temperature calculated in MAAP is used to define core damage. Analysis and justification for the use of MAAP4 to define core damage is provided in Section 2.1.1 of the, Performance Requirements for Maintaining Core, Vessel, and Containment Integrity During Severe Accidents notebook. Section 2.1.1 of the performance requirements notebook should be referenced in the Event Tree / Success Criteria Notebook to avoid confusion on the use of MAAP4 with the limitation described. This is a suggestion to clarify documentation in the Event Tree / Success Criteria Notebook.	Reference to MAAP limitations have been incorporated in the Event Tree/Success Criteria Notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
AS-B3 **(Met Cat I/II/III)**	1-20: There is no separate success criteria notebook in the Susquehanna documentation. Rather, the plant uses the event tree notebook for both AS and SC technical elements. This results in some of the success criteria information being scattered through the event tree sequence descriptions. This is a suggestion, since it is a potential documentation enhancement.	Open item	Documentation item. No impact
AS-B5 **(Met Cat I/II/III)**	1-21: Expanded documentation of the FFT model top logic would facilitate greater understanding of the model by PRA engineers new to the group and would further enhance the scrutinizing of the model. This is a suggestion since it involves model documentation only.	Open item	Documentation item. No impact

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
AS-C1 **(Met Cat I/II/III)** Related SRs AS-A11 (Met Cat I/II/III)	1-13: The accident sequence model is constructed using a very large number of transfers. This made the model difficult to review. It is also constructed in a manner such that the CDF tree and the Level 2 tree are integrated. While there is no evidence from the peer assessment that was performed that the model fails to accurately model the as-built, as-operated plant (the quantification results are reasonable given the operation and design of the plant). However, the event tree structure does not lend itself readily to evaluation. This should not hamper the ability to pursue PRA applications. However, as more hazards are added to the spectrum of the PRA (internal fire, seismic, etc.) the event tree structure may become difficult to deal with. This is a suggestion because it primarily addresses potential issues that may arise in the future.	Open item	Documentation item. No impact
AS-C1 **(Met Cat I/II/III)**	1-46: Consider the creation of a separate LOOP tree. This would allow for increased model readability and would diminish the need for the use of recoveries. This is a suggestion, since the as-built, as-operated plant is effectively represented by the current model.	Open item	No impact. The F&O suggests a different method to model the Loss Of Off-Site Power.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SC-A3 **(Met Cat I/II/III)** <u>Related SRs</u> SC-C1 (Met Cat I/II/III) AS-A2 (Met Cat I/II/III)	3-2: Section 2.6.2 of the Event Tree/Success Criteria Notebook describes the core protective functions identified in the AS and SC Notebook. Table 3.3.1 through 3.3.11 (LOCA) and Table 3.4.1 through 3.4.10 (TRANSIENT) provide the functional level SC for the key critical safety functions for each initiator category. Attachment M provides key results of MAAP runs to support the SC. However, no similar Tables as LOCA and TRANSIENT key safety functions were found that described the key safety functions for ATWS and ISLOCA. This is a document suggestion.	Open item	Documentation item. No impact

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SC-A6 **(Met Cat I/II/III)**	3-3: The success criteria given are consistent with the features described in the system notebook document. The MAAP input deck and runs use flows, pressures, and other parameters that are consistent with the values described in the station system description documents and in the PSA system notebooks. The success criteria are also tied to plant's procedures. However, there is a plant modification on the Fire Water System to replace a 50 foot 3' inch hose with 200 foot of 5 inch hose. System flow is potentially increased, and SC might need to be updated to reflect the plant as-build condition. This may improve the plant over SC as well. This a finding since the unanalyzed modification may impact overall model success criteria and implemented logic.	System flow used for MAAP analysis is conservative (i.e. lower) relative to predicted post-modification system flow. Therefore, the current credit for fire water makeup based on the MAAP analyses are conservative. No modeling changes are made at this time, but this should be considered in a future PRA model update.	Negligible, the current analyses are conservative. However, using a higher fire water pump flow has the potential to yield success for re-flooding the core after depressurization. If this is successful, the fire pump, injection flow path and operator action for the fire water injection alignment would become more important.
SC-B4 **(Met Cat I/II/III)** <u>Related SRs</u> AS-A9 (Met Cat III)	2-2: Event Tree / Success Criteria Notebook Section 2.1.6 describes Thermal-Hydraulic Code Limitations. There is no discussion of the MAAP4 limitation concerning its use in analysis of large break LOCAs. This is a suggestion since the large LOCA MAAP calculations were compared to existing BWRSAR calculations and found acceptable for use in the PRA.	Documentation issue. Reference to BWRSAR/MAAP comparison was added to the Event Tree/Success Criteria Notebook section 2.1.6.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SY-A3 **(Met Cat I/II/III)**	5-4: PRA model system functions documented in Section 1.2 of the system notebooks are based on Maintenance Rule functions. Did not find a reference for the source of these functions (e.g., Maintenance Rule basis document) identified in the system notebooks. This is a suggestion because it pertains primarily to documentation.	Open item	Documentation item. No impact.
SY-A10 **(Met Cat I/II/III)** <u>Related SRs</u> HR-F2 (Met Cat III) SY-A2 (Met Cat I/II/III) SY-C2 (Met Cat I/II/III)	5-3: The effect of variable success criteria was not clearly documented for three system notebooks RCIC), CRD and CST and RWST. For example, success of RWST is defined simply as to provide manual makeup to the Unit 1 CST and the Unit 2 CST. Timing information is found in the event tree notebook for different scenarios. The evaluation of 037-N-N-RWST-O in the HRA notebook indicates a different timing than found in the event tree notebook. It is not clear from the CRD system notebook what CRD flow is credited and the basis in success criteria. It would be clearer if this and other success criteria are documented in a separate notebook to tabulate various combinations of criteria applicable to accident scenarios. This is a suggestion because it applies to documentation only.	Open item	Documentation item. No impact.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SY-A13 **(Met Cat I/II/III)**	6-31: Assumption 2 of Section 2.2 (general assumptions) in the System Notebook Template discusses screening potential flow diversion paths if the diameter of the pathway is less than 1/3rd the diameter of the primary pathway. This assumption may not necessarily be true and requires more justification on a system-by-system basis. Per discussion with PRA staff, the general assumption on 1/3rd pipe diameter is not actually used. Flow diversion are analyzed on a system by system basis, and are documented in Section 2.1.3 of each notebook discusses the identified flow paths. This is a suggestion to remove the unused assumption from the notebook.	Open item	Documentation item. No impact.
SY-A15 **(Met Cat I/II/III)**	6-32: Per the system notebook template, several components/failure modes have been screened (plugging of components, leakage/rupture of a components, etc.). This appears to be in accordance with the requirements of this SR. However, some additional discussion to verify appropriate screening should be added to the documentation. This is a finding since quantitative criteria were not cited.	Open item	Documentation item. No impact. .

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SY-A16 **(Met Cat I/II)**	6-33: Discussion of these events was not found in the system notebooks and were expected to be found in Section 2.3.2 (example, discussion of pre-initiator events such as 054-I-AC-PMP-H was not found in the ESW notebook, outside the "copy-paste" of the fault tree and cutsets). This is a suggestion as the pre-initiator events are included in the model and the HRA documentation but are not described in the system notebooks.	Open item	Documentation item. No impact.
SY-A21 **(Met Cat I/II/III)**	1-25: The RHR System Notebook contains a reference point estimate probability for the RHR water hammer event that is postulated in NEDO-33150-NP (BE 149-II-N-H20_PART). An expanded discussion of this phenomenology should be presented and details of its injection accident sequence model should be presented. This is a suggestion since it is a documentation enhancement.	Open item	Documentation item. No impact.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SY-B3 **(Met Cat I/II/III)**	1-17: Check valve CCF is slightly more than 2 orders of magnitude lower in CCF probability than MOV failures, but less than 2 orders below pump failure to start and failure to run CCF terms. Therefore, it is not appropriate to screen check valve CCF unless there are MOVs (or other high CCF failures) in the system. Of particular concern are check valves which are within injection pathways to the reactor shared by multiple systems (such as one injection line through with HPCI and FW inject and the opposite injection line inject RCIC and FW) in which the shared lines only have check valves. CCF modeling of such check valves is important to incorporate. This is a finding because there is a potentially significant common cause failure that was not added to the model.	Upon review, it was determined that check valve CCF basic event terms for the HPCI/RCIC Feedwater (FW) injection paths and ESW paths should be included in the risk model. The basic events and CCF data is as documented in the component data notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SY-B3 **(Met Cat I/II/III)**	6-34: Selection of CCF groups is discussed in Data Notebook Section 3.0. CCF groups follow guidance in NUREG/CR-5485 and are based on similarities in service conditions, environment, design or manufacturer, maintenance. CCF groups included pumps, MOVs, air compressors, etc. However, per discussion in Section 3 of Data Notebook, some component types, such as filters, check valves, and circuit breakers, were screened due to low probability. This may not necessarily be true. For example, based on Table 4-1 the probability for 2 of 4 RHR pumps failing to start is 8.4E-7. With a probability of a check valve failing to open of 1E-5 and assuming a Beta factor of 8.5E-3, a probability of 2 of 4 pump discharge check valves failing to open would be ~1E-7, which is less than 2 orders of magnitude lower than the pump failure to start CCF term. In addition, plugging of strainers/HXs/etc. can have CCF probabilities that are within an order of magnitude or two less than their independent probabilities. This is a finding as some CCF terms may have been inappropriately screened from the model. Possible Resolution Demonstrate that screened CCF terms were appropriately screened, or incorporate them into the model.	Section 4.3.24 of Component Data Notebook evaluates the CCF for check valves in the RHR, CS and RHRSW systems. The conclusion is the CCF of check valves in these systems is not required since their CCF is more two orders of magnitude lower than the highest failure probability of the other components in the same system train that results in the same effect on system operation. Strainer (filter) plugging for the RHR and Core Spray Pumps is modeled. The CCF of circuit breakers for motor driven equipment is not modeled since the failure of the circuit breaker for motor driven equipment is included in the failure rate of the driven equipment (NUREG/CR-6928).	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
SY-B15 **(Met Cat I/II/III)**	5-6: Section 2.3.2 in each of the system notebooks discusses human interactions and lists HRA basic events. Also refer to the HRA notebook. An example of operator interface dependencies across systems is 037-N-N-XTIE-O, OPERATOR FAILS TO XTIE RWST TO CST, which provide CST makeup from the RWST. This HRA basic event is among the events listed in Section 2.3.2 of the RCIC system notebook, but was not included in Section 2.3.2 of the HPCI and Core Spray system notebooks. Documentation of operator interface dependencies across systems in the systems notebooks is not complete. This is a suggestion because it only pertains to documentation.	Open item	Documentation item. No impact.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-A3 **(Met Cat I/II/III)**	5-2: Statement in Section 4.1.2.1 on page 60: Due to staggered testing/maintenance practices, like components in different divisions are generally not susceptible to restoration errors and "common mode" errors are screened. This is a finding. Need basis for not identifying the work practices identified above (HR-A1, HR-A2) that involve a mechanism that simultaneously affects equipment in either different trains of a redundant system or diverse systems [e.g., use of common calibration equipment by the same crew on the same shift, a maintenance or test activity that requires realignment of an entire system (e.g., SLCS)].	This item was determined to be a documentation and terminology issue and the manner that SR HR-A3 redundant systems was treated in the HRA notebook, specifically the systems review in section 4.1.2.1.After further review of SR HR-A3, it was determined that only single activities that simultaneously disable redundant trains or diverse systems require the development of common mode failure events, as exemplified in SR HR-A3. Maintenance acts that are directed by separate procedures on different divisions or systems, even if they are performed in an outage, are NOT required to be identified as common mode failure events. The identification process used in the SSES pre-initiator HRA is consistent with SR HR-A3. The documentation was updated to provide clarification.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-B1 **(Met Cat II/III)**	7-2: Although some screening criteria are identified in selected sentences throughout the document, a succinct section outlining screening criteria is not reiterated in the HRA Notebook. Although Section 4.1.2.1 of the HRA Notebook, largely identifies components that are to be included in the analysis, this section does not succinctly identify the criteria under which components and actions can be screened from the analysis. Note that it is stated in section 4.1.2.1 that "Miscalibrations that impact a single component may be screened from further consideration and assumed to be inherent in the component failure rate." Screening calibration activities on that basis is not a screening criteria of ASEP as identified in this associated supporting requirement: SR-B1. Therefore since unique screening criteria have been used in the Susquehanna HRA analysis that is not part of the ASEP process, a succinct and comprehensive listing of all pre-initiator screening criteria is required. Later, Section 4.1.2.5 refers to the procedures used for the pre-initiator analysis of HFEs identified as 'risk-significant', which are listed in Attachment C. It is not noted however, if these procedures provide the post maintenance functional tests that would reveal misalignment It is noted that Attachment F of the HRA notebook defines some screening criteria for pre-initiator identification which presents screening of plant experience related to potential restoration errors or miscalibration errors to identify additional pre-initiator actions worthy of inclusion in the model. This is a finding because a complete set of screening criteria for Type A events was not found in the documentation.	The HRA notebook, Section 4.1.2.1, has been updated to include a specific set of screening criteria. The text has been updated to clarify what the test needs to do in order for it to be credited (identify the error). The description of the potential recovery mechanisms has also been enhanced to clarify that mechanisms described in section 4.1.2.5 are the same as those listed for each procedure review section.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-C2 **(Met Cat II/III)**	7-5: Restoration errors screened on the basis of an administrative work practice procedure which may not be applicable during all stages of low power and shutdown modes. This is a finding because it is possible to have restoration errors during low power and shutdown modes that affect equipment across system trains.	SR HR-C2 is attempting to ensure that specific failure modes are addressed for the unscreened activities. SSES does not have unscreened common mode misalignment events. In addition, based on the clarification and further review of SR HR-A3, the HR-A3 requirement identifies that only single activities that simultaneously disable redundant trains or diverse systems require the development of events. Separate procedures/maintenance acts on different divisions or systems (even if they are performed in an outage) are NOT required in the development of events. Clarification was provided in the HRA notebook in revision 5.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-D2 **(Met Cat II)** Related SRs HR-G1 (Met Cat II) QU-F6 (Met Cat I/II/III)	7-7: A detailed analysis has been performed for the HFEs that had a risk achievement worth (RAW) greater than or equal to 2.0 or a risk reduction worth (RRW) greater than or equal to 1.005. Consideration should be given to using the FV directly per the ASME Standard wording rather than indirectly through RRW. This is a suggestion because it pertains to more direct correlation with the standard. Use the ASME Standard and RG 1.200 parameter of a FV = 0.005 rather than the RRW to avoid confusion.	Expanded and/or corrected discussion was provided in the HRA notebook, sections 4.2.3 and 4.2.1.4.	None, gap has been closed for the JUL12R1 model.
HR-D2 **(Met Cat II)**	5-1: The screening criteria and values used need to be more clearly defined within the Susquehanna HRA as also noted in SR HR-B2. The nominal ASEP methodology has been used in the Susquehanna HRA as the detailed methodology. This is a suggestion, since there is no direct evidence that important contributors have been missed.	Scoping values of 0.01 for independent pre-initiator events and 0.001 for common cause pre-initiators are judged as reasonable scoping estimates as described in Section 4.1.2.4 of the HRA Notebook. The 1E-2 value that SSES employed is per the NRC's guidance in NUREG-1792 document.	None, gap has been closed for the JUL12R1 model.
HR-E4 **(Met Cat II/III)**	1-1: Simulator observations should be conducted to further confirm the validity of assumptions in modeled operator actions. This is a suggestion, since there is no requirement for such observations if a 'talk-through' was performed.	Open item	Negligible, F&O is a suggestion that would enhance the HRA analysis.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-F2 **(Met Cat III)** Related SRs AS-B3 (Met Cat I/II/III)	1-19: RHRSW is credited for external injection past containment venting. It was noted that the injection path must lined up (MOVs opened) before venting by procedure. However, there is no step in the execution or cognitive portion of the HEP 013-N-N-RHRSWXTIE This is a finding, since it may affect the value for the HEP and the quantification.	013-N-N-RHRSWX_L-O was added to the model as a late RHRSW crosstie action to maintain alternate injection after PC venting. The venting procedure steps to open the RHRSW crosstie valves prior to venting are included in the execution error. The execution error for both 013-N-N-RHRSWXTIE and 013-N-N-RHRSWX_L-O reflects RHRSW alignment as alternate RPV injection.	None, gap has been closed for the JUL12R1 model.
HR-G1 **(Met Cat II)**	1-10: Basic Event 054-01222AB-24AB1-O uses a screening HEP value. While this is by definition not a risk significant function by RAW or FV, the action does appear in some cutsets above 1E-9. This is a suggestion, since screening values are allowed by the standard for non-significant events for Cat II.	Open item.	Negligible, F&O is a suggestion that would enhance the HRA analysis.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-G2 **(Met Cat I/II/III)**	7-8: The combination sum technique presented in the HRAC has no theoretical basis. Although all of the HFE methodologies have limitations, it is more defensible to choose an industry reviewed methodology that most closely models the scenario according to the known limitations of the methodology rather than adding the cognitive errors of two unlike methodologies to compensate for timing uncertainties. This is a suggestion. While the HRA Calculator allows this approach, its basis may be subject to challenge.	The Peer Review suggestion questions the combination sum technique used in the EPRI HRA calculator and recommends consideration of another approach. It was determined acceptable to retain the combined method for actions with limited time available for recovery because the combined method provides both the detailed assessment of the CBDTM PSFs and accounts for the expected increase in Pc if the time available for recovery is limited. The method is retained because it allows detailed PSF (Performance Shaping Factors) assessment and accounts for the expected increase in cognitive error associated with limited time available for recovery and is allowed within the use of the HRAC	None, gap has been closed for the JUL12R1 model.
HR-G4 **(Met Cat II)**	1-8: The description for event 013-N-N-RHRSWXTIE-O is OPERATOR FAILS TO TIE IN FIRE MAIN OR RHRSW WITHIN 29 MINUTES. The mission time for this event, however, is 100 minutes. This is a suggestion because the timing analysis for the event is correct.	The title of 013-N-N-RHRSWXTIE-O was corrected in the HRAC database and in the HRA Notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-G5 (Met Cat II)	1-4: There are several instances in the HRA Notebook where the previous HRA analysis (Notebook) is quoted as a reference for the manipulation time. The basis for these manipulation times should be carried forward to the new documentation. This is a suggestion, since there is a basis for the manipulation time and this issue pertains only to documentation.	The basis for manipulation times was carried forward in the HRA Notebook.	None, gap has been closed for the JUL12R1 model.
HR-G5 (Met Cat II)	1-5: There is no documented basis for the manipulation time for 013-N-N-RHRSWXTIE-O. Note that the utility staff subsequently noted an accurate basis for the timing. This is a suggestion, since the utility stated a basis for the manipulation time.	The manipulation time for 013-N-N-RHRSWXTIE-O was obtained via PPL operator interviews and reference was. added to the HRA Notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-G7 **(Met Cat I/II/III)** <u>Related SRs</u> QU-C1 (Met Cat I/II/III)	1-7: Dependent HEPs MAN-OP_SPC_INJ_L-O and 159-CNTVNT-O are found in a dependent HEP Group with three elements. However, they are not in a dependent HEP Group by themselves (two event combination). This appears to be inconsistent. Table 5.3-1 gives an explanation that there is zero dependency between the actions. However, it appears that the timing information for 159-CNTVNT-O in that table does not match that in the HRA Calculator Database. If the timing in the HRA calculator database for that event is used, it would appear that there is, in fact, some level of dependency between these events. This combination is important to the mitigation of long term DHR related sequences. This is a finding because it has quantitative impact.	The HRA dependency analysis has been completely re-performed with the JUL12R1 model. Additionally, F&O 1-7 has 2 parts: the dependency analysis question with regard to the manual MOV operation with containment venting actions, and the timing differences in the dependency analysis file (DAF) and the HRAC. The second part of the explanation addresses the need for the timing differences between the DAF and the HRAC in order to force the actions into their expected chronological order. The first issue starts with MAN-OP_SPC_INJ_L-O which was broken into 2 actions: MAN-OP_SPC_L-O and MAN-OP_INJ_L-O. The revised HRA dependency analysis includes a dependent HEP for the new SPC action and both versions of containment venting. The 159-CNTVNT-O action is in Combination 52. Combination 51 has MAN-OP_SPC_L-O and 159-CNTVNTLOCAL-O. Additionally, since MAN-OP_SPC_INJ_E-O is not credited due to the timing constraints (i.e., HEP value = 1.0 and it is set to TRUE prior to quantification), there are no dependent HEPs which involve this early action.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-G7 **(Met Cat I/II/III)**	1-9: The HEP values that are part of a dependent group are sometimes assigned and HEP in the RR file that is arbitrarily high. After performing the quantification, a post processing recovery is applied to these non-dependent HEPs to return them to their "true" value. Although the true HEP value is seen in the HEP description, it is somewhat confusing to someone not familiar with the model; it can also cause issues when using the RR file to perform query operations for data extraction from the model. This is a suggestion because it does not affect quantification.	The processing of the HEPs has been revised. A JUL12R1 model flag file has been created to elevate the HEPs prior to quantification, and the real values are maintained in the JUL12R1.RR file.	None, gap has been closed for the JUL12R1 model.
HR-H2 **(Met Cat I/II/III)**	1-48: A spot check of several HFEs within the Susquehanna 2011 HRA Update in V 411 used with the DAF. HRA file reveals that individual operator actions are selectively credited where appropriate for recovery of potential execution errors. However the dependency values are often not used with the HRA calculator for the cognitive decision trees when a LD is assessed. While the use of "N/A" produces realistic results in the case of ZD it provides unrealistic low values for cases where a higher dependency is suggested. This is a suggestion, since it is not deemed to be quantitatively significant.	Open item	Negligible, this F&O is quantitatively insignificant.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #,* DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
HR-I2 **(Met Cat I/II/III)**	7-12: The Susquehanna HRA Notebook, PA-B-NA-041, documents the process used to characterize the HFEs used in the model. It is noted however that some documentation is provided within the notebook which does not actually reflect the process used. For example, assessing recovery factors based on time phasing appears not to have been done as is described in Table 4.2.1-11 [INCREMENTAL(1) CONDITIONAL FAILURE PROBABILITIES (NON-RECOVERY PROBABILITIES WITHIN EACH TIME PHASE)]. Rather, the recovery factors that are inherent within the HRA Calculator appear to be used in the actual modeling of the HFEs and such recovery factors do not account for time phasing. This is a suggestion because it relates to updating the documentation within the HRA notebook to reflect only what is done in the system models.	Expanded and/or corrected discussion was provided in the HRA notebook, sections 4.2.3 and 4.2.1.4.	None, gap has been closed for the JUL12R1 model.
DA-A1 **(Met Cat I/II/III)** <u>Related SRs</u> DA-A4 (Met Cat I/II/III)	4-6: There is no clear statement documenting that the system analysis or the overall model was used to determine which basic events were identified that required development of data. This is a finding since identification of the basic events from the system analysis is required by the ASME standard.	Documentation was added to the Component Data Notebook.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
DA-C4 **(Met Cat I/II/III)**	4-8: The Component Data Notebook evaluates the unavailability in Appendix B using plant data taken from Maintenance Rule and/or MSPI as shown in Table B-8. Table B-10 shows the Maintenance Rule Functional Failure Data that was evaluated for inclusion in the Bayes update. However, there is no clear basis documented in Section B.2 for how events were screened to identify failures to be included in the model for the data analysis. This is a finding since the requirement is to provide a clear basis for identification of failures for inclusion in the data analysis.	Added discussion for evaluation of failures to Section B.4 of the Component Data Notebook and added cross-reference to categories to the PRA comments field in Table B-10. This revision is in line with the proposed resolution provided by the peer review team and documents the method used for analysis of data applicability.	None, gap has been closed for the JUL12R1 model.
DA-C14 **(Met Cat I/II/III)** <u>Related SRs</u> SY-A20 (Met Cat I/II/III)	1-22: Coincident maintenance unavailability is well accounted for in the Susquehanna PRA. However, there is a maintenance combination of risk significant equipment which may occur that is not accounted for in the PRA model that is allowed by the 13 week schedule. That combination is in Week for of the Table G-1 work matrix, which is the Blue Max portable diesel generator and the B/D ESW HVAC system. This is a suggestion, since the equipment is not considered to be redundant per strict interpretation of the ASME Standard requirement.	A sensitivity case is now discussed in the component data notebookSection B.3.3 which indicates that this additional combination is not warranted due to very low risk impact. Other combinations were not identified.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
DA-E1 **(Met Cat I/II/III)** <u>Related SRs</u> AS-C1 (Met Cat I/II/III) SY-C1 (Met Cat I/II/III)	4-7: Sections in the Summary Notebook and in the Component Data Notebook are identified as "Appendices..." when in fact the notebooks identify the corresponding sections as "Attachments". Table B-1 in the Component Data Notebook refers to sections of the notebook and to the Systems Notebooks as "Appendix…" when in fact they are identified as "Attachment...". This is a suggestion since it involves documentation only. The roadmap designation of "Appendix…" led to confusion and difficulty in finding the correct section in the notebook.	The Component Data Notebookwas revised to incorporate the title Attachment instead of Appendix where appropriate.	None, gap has been closed for the JUL12R1 model.
QU-B7 **(Met Cat I/II/III)**	1-47: There is a general discussion regarding the rationale for the combinations in the mutually exclusive file. However, the rationale for each combination is not explicitly discussed in the documentation. This is a suggestion because it pertains to documentation only.	The JUL12R1 model Quantification and Summary Notebook, section A.2 and Table A.2-1, provide the mutually exclusive basic event combinations and the basis for exclusion.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
QU-B9 **(Met Cat I/II/III)**	1-38: It was noted that there are several negated events with a probability of 0.0 that appear in the CDF cutsets (specifically, events like -EFORB). These events, while useful for the cutset readability and debugging, should be set to false in a flag file for "production" quantifications. This does not have a significant impact on the quantification (it only adds an insignificant conservatism) and therefore is a suggestion.	Added 0.0 probability events to flag file as false to be assigned prior to quantification.	None, gap has been closed for the JUL12R1 model.
QU-D1 **(Met Cat I/II/III)** <u>Related SRs</u> QU-D5 (Met Cat I/II/III)	6-35: Only the top 10 cutsets are listed or described in any detail. The percent contribution to total CDF of these cutsets was not give, although the individual contributions are (the total appears to be ~30% of CDF). A listing of those cutsets selected for in-depth review for the non-significant cutset review process would enhance the documentation. This is a suggestion as the review of cutsets appears to be thorough, based on discussions with PRA staff.	This peer review suggestion is directed to SR requirements QU-D1 and QU-D5. Requirement QU-D1 requires reviewing a sample of the significant accident sequences/cutset sufficient to determine that the logic is correct. QU-D5 involves reviewing a sample of non-significant accident cutsets or sequences to determine they are reasonable and have physical meaning. Instead of selecting a random number of cutset to review, the top cutsets contributing > 1% to the overall CDF/LERF were reviewed. This constitutes a review of significant cutsets. A sampling of non-significant cutsets was selected for review of reasonableness and meaning. These cutsets and their description were added to the summary notebook where in the past, only conclusion of reasonableness was provided.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
QU-D2 **(Met Cat I/II/III)**	6-38: Section 3.4 of Attachment A of the Summary Notebook discusses dominant core damage sequences and provides a description of why these sequences result in CDF/LERF. However, further review and discussion of the results would help verify model reasonableness. Section 4 includes a review of basic event importance, initiator contributions to CDF/LERF, and significant operator actions. The discussion is focused on what items changed since the previous revision, rather than the reasonableness of the results (i.e., why is LOOP ~50% of CDF when the plant has a 5th diesel and the Blue Max diesel to for charging batteries?). This is a finding as further documented review and discussion of results is needed to verify the reasonableness of the model.	The item identified requests additional discussion and justification to the statements of reasonableness. The Quantification and Summary Notebook was revised to include additional sequence discussion and justification of reasonableness given plant operation. Additional discussion for LERF differences found in section 3.5 was also provided. Section 4.1, important systems, was also enhanced by providing a discussion of the component basic event importances. In general, where appropriate, additional discussion was added to results sections to better demonstrate statements of reasonableness.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
QU-D6 **(Met Cat II/III)**	6-37: Importance of Operator actions are given in terms of RAW and RRW. However, the quantification process appears to remove dependent HEPs from the cutsets and replace them with a single basic event containing the total dependent failure probability. No discussion was found regarding how this might impact Importance Measures for HEPs. This is a suggestion as it does not directly impact the model or quantification process, but can distort model results if the effects are not accounted for.	The dependent operator action basic event nomenclature that was provided in the JUL12 risk model was determined not complete. During the peer review, the noted operator actions provided to the peer review team were only independent actions. Upon review of the basic events, it was determined that the dependent operator action nomenclature did not include the -O at the end of the basic event name. Therefore, upon data sorting, the complete list of operator actions was not initially provided to the peer review team. The dependent operator actions are identified by a beginning letter Z annotation and now end with a -O annotation. Therefore any future assessment and search for operator actions and their importance will be complete. All operator actions both independent and dependent now end with -O.	None, gap has been closed for the JUL12R1 model.

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SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
QU-D7 **(Met Cat I/II/III)**	6-36: Importance measures for basic events are given in Table 4.1-1, and appears to be based on RRW > 0.1. The Summary Notebook indicates that these results were reviewed and appear reasonable. Importance measures for all basic events are given in Attachment B for CDF (both units), and Attachment C for LERF (both units). While Table 4.1-1 is titled 'Important Components to Reduction in Risk (RRW)', this appears to be a misnomer as the items listed in the table are basic events. No component importance measures were found in the documentation. This is a finding as reviewing component importance is required by this SR.	Section 4.1 of the Quantification and Summary Notebookprovides a review of component/system basic event importance. The importance measures reviewed in the notebook were revised to include Fussell-Vesely and Risk Achievement Worth (RAW). The listed basic events are those having importance measures FV greater than 0.005 and RAW greater than 2. A discussion supporting a reasonable results conclusion was provided. The results were determined to be acceptable when considering plant configuration and the changes made to the PRA model during the latest data update.	None, gap has been closed for the JUL12R1 model.
QU-E2 **(Met Cat I/II/III)**	1-44: With the exception of the system notebooks, assumptions tend to be scattered throughout the documents. Consider consolidating all assumptions into a single section of each technical notebook. This is a suggestion since it applies to documentation only.	Open item	Documentation item. No impact

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
QU-E3 **(Met Cat III)** <u>Related SRs</u> DA-D3 (Met Cat II)	1-26: There are several classes of basic events which do not have associated error factors. These include: internal flooding initiators, unavailabilities, and certain operator actions. This causes the distribution calculated by Uncert to be narrower than it would be had error factors been included for these parameters. This is a finding because it relates to the results of the parametric uncertainty.	Error Factors were added for all basic events or type codes in the risk model reliability database file	None, gap has been closed for the JUL12R1 model.
QU-E3 **(Met Cat III)**	1-45: No discussion of the results of the Parametric Uncertainty Analysis was found. No calculation of the Error Factor (95%/50%) was found. No statement regarding the reasonableness of the CAFTA mean value was found. This is a finding since it relates to fundamental information necessary for most application submittals.	The JUL12R1 model uncertainty analysis provided in the Quantification and Summary Notebookwas updated to include a full discussion of uncertainty including the provision of a mean value comparison table, additional uncertainty graphs for 1CDF, 1HE, 2CDF, and 2HE, and a specific conclusion section discussing results, mean, and skewness.	None, gap has been closed for the JUL12R1 model.
QU-F3 **(Met Cat II/III)**	6-40: No initiating event pie chart was given for Unit 2 results. The Summary Notebook states that Unit 2 results are similar. No importance measures for components or systems were given in the documentation. This is a suggestion to enhance the model documentation.	The Quantification and Summary Notebook was revised to include initiating events pie charts for 1CDF, 2DF, 1HE, and 2HE.	None, gap has been closed for the JUL12R1 model.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
LE-C10 **(Met Cat II)** Related SRs LE-C12 (Met Cat II)	3-5: Per discussion with plant staff, although a review of sequences was not performed "after the fact" to try to further reduce LERF. Rather, the event trees were built to credit equipment operation and operator actions as would be warranted given the conditions. The sequences were reviewed in this process. That is, only actions from the control room and equipment that could be reasonably assumed for success were credited. In this fashion, no additional engineering analyses were warranted to support continued operation of equipment or operator actions during accident progression that could reduce LERF. It was determined that this process should be documented in the AS/SC notebook. It was determined that documentation of the process that was utilized to evaluate the accident sequence procession is necessary to affirm for PRA applications that an evaluation was performed.	The process for evaluating accident sequence progression was added to the Quantification and Summary Notebook.	None, gap has been closed for the JUL12R1 model.
LE-F3 **(Met Cat I/II/III)**	1-43: Understanding LERF uncertainty in the Susquehanna model would be improved by having LERF related assumptions were clearly identified and listed in a single place (e.g., a section of the summary notebook or elsewhere). This is a suggestion because it applies to documentation only.	Open item	Documentation item. No impact.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
LE-G5 **(Met Cat I/II/III)**	2-4: Appendix E, Section E.6 of the Summary Notebook evaluates the limitations of the LERF evaluations related to the quantification process. This does not address the limitations of the LERF analysis due to assumptions or modeling choices. This is a suggestion to provide a more complete description of the LERF analysis limitations for applications.	Section E is related to quantification limitations, and would not be appropriate for incorporation of limitations due to modeling choices. Therefore, Section 2.10.1 was added to the JUL12R1 Quantification and Summary Notebook for a discussion of potential limitations that could influence LERF results in applications.	None, gap has been closed for the JUL12R1 model.
IFPP-A1 **(Met Cat I/II/III)** <u>Related SRs</u> IFPP-B1 (Met Cat I/II/III)	6-1: Based on discussion in Section 3.1 and contents of Appendix C of the Internal Flooding notebook, flood areas are based on plant rooms, which appear to be generally independent of other areas regarding flood propagation. Many buildings and structures were eliminated from further consideration on the basis that they do not contain any SSCs modeled in the PRA, as identified in Section 3.1.1.2 However, it is not clear if there exists a potential for a flood in one of these areas to propagate to a building/area that does contain flood susceptible PRA equipment. Based on discussions with PRA staff and review of the plant layout drawing, only the Radwaste building is connected to the main portion of the plant. This is a suggestion as the list of screened buildings appears reasonable.	Open item	Negligible effect on model results. See PRA Impact from Internal Flooding discussion, which preceeds Table 1.

TABLE 2

SUPPORTING REQUIREMENTS MEETING CAPABILITY CATEGORY II OR GREATER WITH ASSOCIATED FACTS AND OBSERVATIONS

SUPPORTING REQUIREMENT	*F&O #*, DESCRIPTION OF GAP, AND *SIGNIFICANCE*	RESOLUTION	IMPACT
IFQU-A2 **(Met Cat I/II/III)**	1-28: Consider using the FRANX or other declarative modeling tool for the injection of flooding initiators (and other spatially oriented initiators, such as internal fire, or external event initiators such as seismic). This is a suggestion, since there is no requirement to use a declarative modeling technique for injection of flooding initiators.	Open item	None, F&O suggests a way of adding flood initiators to the model and is an enhancement.
MU-C1 **(Met Cat I/II/III)** <u>Related SRs</u> MU-E1 (Met Cat I/II/III)	1-27: There is no requirement to issue the development model as the updated model based upon the quantitative impact on PRA applications (such as MSPI) in the Susquehanna model maintenance procedures. This is a finding because it causes the SR to be not met. *(This F&O may be a finding however both of the associated SRs were noted as met.)*	Open item	None, F&O addresses the PRA Maintenance and Update Procedure.

Attachment 3 to PLA-7119

Markups of Existing Technical Specifications

1.1 Definitions (continued)

RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3952 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical assuming that: a. The reactor is xenon free; b. The moderator temperature is 68°F; and c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.
~~STAGGERED TEST BASIS~~	~~A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during η Surveillance Frequency intervals, where η is the total number of systems, subsystems, channels, or other designated components in the associated function.~~
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TURBINE BYPASS SYSTEM RESPONSE TIME	The TURBINE BYPASS SYSTEM RESPONSE TIME consists of the time from when the turbine bypass control unit generates a turbine bypass valve flow signal

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	~~24 hours~~In accordance with the Surveillance Frequency Control Program
SR 3.1.3.2	NOT USED	
SR 3.1.3.3	----------NOTE---------- Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. ---------- Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 05 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	In accordance with the Surveillance Frequency Control Program ~~200 days cumulative operation in MODE 1~~
SR 3.1.4.3	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with any reactor steam dome pressure.	Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect scram time
SR 3.1.4.4	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after fuel movement within the affected core cell AND Prior to exceeding 40% RTP after work on control rod or CRD System that could affect scram time

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more control rod scram accumulators inoperable with reactor steam dome pressure < 900 psig.	C.1 Verify all control rods associated with inoperable accumulators are fully inserted.	Immediately upon discovery of charging water header pressure < 940 psig
	AND	
	C.2 Declare the associated control rod inoperable.	1 hour
D. Required Action and associated Completion Time of Required Action B.1 or C.1 not met.	D.1 ----------NOTE---------- Not applicable if all inoperable control rod scram accumulators are associated with fully inserted control rods. ----------	
	Place the reactor mode switch in the shutdown position.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.5.1 Verify each control rod scram accumulator nitrogen pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program~~7 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Nine or more OPERABLE control rods not in compliance with BPWS.	B.1 ----------NOTE---------- Rod worth minimizer (RWM) may be bypassed as allowed by LCO 3.3.2.1. ---------- Suspend withdrawal of control rods.	Immediately
	AND	
	B.2 Place the reactor mode switch in the shutdown position.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution is within the limits of Figure 3.1.7-1.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.1.7.2	Verify temperature of sodium pentaborate solution is within the limits of Figure 3.1.7-2.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.1.7.3	Verify temperature of pump suction piping is within the limits of Figure 3.1.7-2.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.1.7.4	Verify continuity of explosive charge.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.1.7.5	Verify the concentration of sodium pentaborate in solution is within the limits of Figure 3.1.7-1.	Inaccordance with the Surveillance Frequency Control Program~~31 days~~ AND Once within 24 hours after water or sodium pentaborate is added to solution AND Once within 24 hours after solution temperature is restored within the limits of Figure 3.1.7-2

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.6	Verify each SLC subsystem manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.1.7.7	Verify each pump develops a flow rate ≥40.0 gpm at a discharge pressure ≥1250 psig.	In accordance with the Inservice Testing Program
SR 3.1.7.8	Verify flow through one SLC subsystem pump into reactor pressure vessel.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~
SR 3.1.7.9	Verify all heat traced piping between storage tank and pump suction is unblocked.	In accordance with the Surveillance Frequency Control Program~~24 months~~ AND Once within 24 hours after solution temperature is restored within the limits of Figure 3.1.7-2
SR 3.1.7.10	Verify sodium pentaborate enrichment is ≥88 atom percent B-10.	Prior to addition to SLC tank.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	----------NOTE---------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. ---------- Verify each SDV vent and drain valve is open.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤30 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	~~24 months~~In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 24 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program~~24 hours thereafter~~ AND Prior to exceeding 44% RTP

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 24 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program~~24 hours thereafter~~ AND Prior to exceeding 44% RTP
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SRs in 3.1.4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 24 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program~~24 hours thereafter~~ AND Prior to exceeding 44% RTP

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.1.1.2	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.3.1.1.3	----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. ----------	
	Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.3.1.1.4	----------NOTE---------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~7 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~7 days~~
SR 3.3.1.1.6	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to fully withdrawing SRMs from the core.
SR 3.3.1.1.7	----------NOTE---------- Only required to be met during entry into MODE 2 from MODE 1. ----------	
	Verify the IRM and APRM channels overlap.	In accordance with the Surveillance Frequency Control Program ~~7 days~~
SR 3.3.1.1.8	Calibrate the local power range monitors.	In accordance with the Surveillance Frequency Control Program ~~1000 MWD/MT average core exposure~~
SR 3.3.1.1.9	----------NOTE---------- A test of all required contacts does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~92 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program ~~92 days~~
SR 3.3.1.1.11	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Function 1.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ----------	
	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program ~~184 days~~
SR 3.3.1.1.12	----------NOTES---------- 1. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. 2. For Functions 2.b and 2.f, the CHANNEL FUNCTIONAL TEST includes the recirculation flow input processing, excluding the flow transmitters. ----------	
	Perform CHANNEL FUNCTIONAL TEST	In accordance with the Surveillance Frequency Control Program ~~184 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.13	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.14	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.3.1.1.15	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.3.1.1.16	Verify Turbine Stop Valve-Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure-Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.17	----------NOTES---------- 1. Neutron detectors are excluded. ~~2. For Function 5 "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency~~ ~~3. For Function 2.e, "n" equals 8 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. Testing of APRM and OPRM outputs shall alternate.~~ ---------- Verify the RPS RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.18	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Functions 2.b and 2.f, the recirculation flow transmitters that feed the APRMs are included. ---------- Perform CHANNEL CALIBRATION	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.19	Verify OPRM is not bypassed when APRM Simulated Thermal Power is ≥ 25% and recirculation drive flow is ≤ value equivalent to the core flow value defined in the COLR.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.20	Adjust recirculation drive flow to conform to reactor core flow.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.3	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.3.1.2.4	----------NOTE---------- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. ---------- Verify count rate is: a. ≥ 3.0 cps if a signal to noise ratio ≥ 2:1 or b. Within the limits of Figure 3.3.1.2-1	12 hours during CORE ALTERATIONS AND In accordance with the Surveillance Frequency Control Program ~~24 hours~~
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program~~7 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.6	----------NOTE---------- Not required to be performed until 12 hours after IRMs on Range 2 or below. ---------- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.3.1.2.7	----------NOTES---------- 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~184 days~~
SR 3.3.2.1.2	----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.2.1.3	----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.2.1.4	Verify the RBM: a. Low Power Range - Upscale Function is not bypassed when APRM Simulated Thermal Power is ≥ 28% RTP and ≤ Intermediate Power Range Setpoint specified in the COLR.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE		FREQUENCY
	b. Intermediate Power Range - Upscale Function is not bypassed when APRM Simulated Thermal Power is > Intermediate Power Range Setpoint specified in the COLR and ≤ High Power Range Setpoint specified in the COLR. c. High Power Range - Upscale Function is not bypassed when APRM Simulated Thermal Power is > High Power Range Setpoint specified in the COLR.	
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.1.6	----------NOTE---------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.1.7	----------NOTE---------- Neutron detectors are excluded. ---------- Perform CHANNEL CALIBRATION	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.1.8	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.3.2.2.2	---------- 1. A test of all required contacts does not have to be performed. 2. For the Feedwater - Main Turbine High Water Level Function, a test of all required relays does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 55.5 inches.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3.1-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3.1-1.	E.1 Be in MODE 3.	12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3.1-1.	F.1 Initiate action in accordance with Specification 5.6.7.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE	FREQUENCY
SR 3.3.3.1.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.3.3.1.2 Not Used.	
SR 3.3.3.1.3 Perform CHANNEL CALIBRATION for all Functions except PCIV Position.	~~24 months~~In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

Refer to Table 3.3.3.2-1 to determine which SRs apply for each Remote Shutdown System Function.

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.3.3.2.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.3.2.3	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.4.1.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV—Closure: ≤7% closed; and TCV Fast Closure, Trip Oil Pressure—Low: ≥ 460 psig.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.4.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.4.1.4	Verify TSV—Closure and TCV Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.5	----------NOTE---------- Breaker arc suppression time may be assumed from the most recent performance of SR 3.3.4.1.6. ---------- Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~
SR 3.3.4.1.6	Determine RPT breaker arc suppression time.	In accordance with the Surveillance Frequency Control Program~~60 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Function with ATWS-RPT trip capability not maintained.	B.1 Restore ATWS-RPT trip capability.	72 hours
C. Both Functions with ATWS-RPT trip capability not maintained.	C.1 Restore ATWS-RPT trip capability for one Function.	1 hour
D. Required Action and associated Completion Time not met.	D.1 Remove the associated recirculation pump from service. OR D.2 Be in MODE 2.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.1	Perform CHANNEL CHECK of Reactor Vessel Water Level, Low Low, Level 2.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.2	---------- A test of all required contacts does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION of the Reactor Steam Dome Pressure-High. The Allowable Values shall be ≤ 1150 psig.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.4.2.4	Perform CHANNEL CALIBRATION of the Reactor Vessel Water Level Low Low, Level 2. The Allowable Values shall be ≥ -45 inches.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.4.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.5.1.2	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.5.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.5.2.2	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.2.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.5.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.6.1.2	---------- 1. A test of all required contacts does not have to be performed 2. For Functions 2.e, 3.a, and 4.a, a test of all required relays does not have to be performed ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.6.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.6	----------NOTE---------- 1. For Function 1.b. channel sensors are excluded. 2. Response time testing of isolating relays is not required for Function 5.a. ---------- Verify the ISOLATION SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.6.2.2	---------- A test of all required contacts does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.2.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.6.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.7.1.2	---------- 1. A test of all required contacts does not have to be performed. 2. For Function 8, a test of all required relays does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.7.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.7.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition B or C not met.	D.1 Declare associated diesel generator (DG) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.8.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.3.8.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.3.8.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5.	D.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately
	AND	
	D.2.1 Initiate action to restore one electric power monitoring assembly to OPERABLE status for inservice power supply(s) supplying required instrumentation.	Immediately
	OR	
	D.2.2 Initiate action to isolate the Residual Heat Removal Shutdown Cooling System.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	----------NOTE---------- Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~184 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 128.3 V for Division A and ≤ 129.5 V for Division B. b. Undervoltage ≥ 110.7 V for Division A and ≥ 111.9 V for Division B. c. Underfrequency ≥ 57 Hz.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.8.2.3	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR	3.4.1.1	----------NOTE---------- Not required to be performed until 24 hours after both recirculation loops are in operation. ---------- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10 million lbm/hr when operating at < 75 million lbm/hr total core flow; and b. ≤ 5 million lbm/hr when operating at ≥ 75 million lbm/hr total core flow.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR	3.4.1.2	----------NOTE---------- Only required to be met during single loop operations. ---------- Verify recirculation pump speed is within the limit specified in the LCO.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR	3.4.2.1	----------NOTES---------- 1. Not required to be completed until 4 hours after associated recirculation loop is in operation. 2. Not required to be completed until 24 hours after > 23% RTP. ---------- Verify at least two of the following criteria (a, b, or c) are satisfied for each operating recirculation loop: a. Recirculation loop drive flow versus Recirculation Pump speed differs by ≤ 10% from established patterns. b. Recirculation loop drive flow versus total core flow differs by ≤ 10% from established patterns. c. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns, or each jet pump flow differs by ≤ 10% from established patterns.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Verify source of unidentified LEAKAGE increase is not service sensitive type 304 or type 316 austenitic stainless steel.	4 hours
A. Required Action and associated Completion Time of Condition A or B not met. OR Pressure boundary LEAKAGE exists.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increases are within limits.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.4.6.2	Perform a CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.4.6.3	Perform a CHANNEL CALIBRATION of required leakage detection instrumentation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2.2.1 Be in MODE 3.	12 hours
	AND	
	B.2.2.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 0.2 µCi/gm.	In accordance with the Surveillance Frequency Control Program~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	----------NOTE---------- Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR cut in permissive pressure. ---------- Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No RHR shutdown cooling subsystem in operation. AND No recirculation pump in operation.	B.1 Verify reactor coolant circulating by an alternate method. AND B.2 Monitor reactor coolant temperature.	1 hour from discovery of no reactor coolant circulation AND Once per 12 hours thereafter Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---------- Verify: a. RCS pressure and RCS temperature are to the right of the most limiting curve specified in Figures 3.4.10-1 through 3.4.10-3; and b. ----------NOTE---------- Only applicable when governed by Figure 3.4.10-2, Curve B, and Figure 3.4.10-3, Curve C. ---------- RCS heatup and cooldown rates are ≤ 100°F in any one hour period; and c. ----------NOTE---------- Only applicable when governed by Figure 3.4.10-1, Curve A. ---------- RCS heatup and cooldown rates are ≤ 20°F in any one hour period.	In accordance with the Surveillance Frequency Control Program~~30 minutes~~
SR 3.4.10.2	Verify RCS pressure and RCS temperature are to the right of the criticality limit (Curve C) specified in Figure 3.4.10-3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.10.6	----------NOTE---------- Only required to be met in single loop operation when the idle recirculation loop is not isolated from the RPV, and: a. THERMAL POWER ≤ 27% RTP; or b. The operating recirculation loop flow ≤ 21,320 gpm. ---------- Verify the difference between the reactor coolant temperature in the recirculation loop not in operation and the RPV coolant temperature is ≤ 50°F.	Once within 15 minutes prior to an increase in THERMAL POWER or an increase in loop flow.
SR 3.4.10.7	----------NOTE---------- Only required to be performed when tensioning the reactor vessel head bolting studs. ---------- Verify reactor vessel flange and head flange temperatures are ≥ 70°F.	In accordance with the Surveillance Frequency Control Program~~30 minutes~~
SR 3.4.10.8	----------NOTE---------- Not required to be performed until 30 minutes after RCS temperature ≤ 80°F in MODE 4. ---------- Verify reactor vessel flange and head flange temperatures are ≥ 70°F.	In accordance with the Surveillance Frequency Control Program~~30 minutes~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.10.9	----------NOTE---------- Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. ---------- Verify reactor vessel flange and head flange temperatures are ≥ 70°F.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Reactor Steam Dome Pressure

LCO 3.4.11 The reactor steam dome pressure shall be ≤ 1050 psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify reactor steam dome pressure is ≤ 1050 psig.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.5.1.2	----------NOTE---------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) cut in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. ---------- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, and the HPCI flow controller are in the correct position.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.3	Verify ADS gas supply header pressure is ≥ 135 psig.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.4	Verify at least one RHR System cross tie valve is closed and power is removed from the valve operator.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.5	Verify each 480 volt AC swing bus transfers automatically from the normal source to the alternate source on loss of power.	In accordance with the Surveillance Frequency Control Program ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.9	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.1.10	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.1.11	----------NOTE---------- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.1.12	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each ADS valve opens when manually actuated.	In accordance with the Surveillance Frequency Control Program ~~24 months on a STAGGERED TEST BASIS for each valve solenoid~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.13	----------NOTE---------- Instrumentation response time is based on historical response time data. ----------	
	Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limit.	In accordance with the Surveillance Frequency Control Program ~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action C.2 and associated Completion Time not met.	D.1 Initiate action to restore secondary containment to OPERABLE status.	Immediately
	AND	
	D.2 Initiate action to restore one standby gas treatment subsystem to OPERABLE status.	Immediately
	AND	
	D.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ 20 ft 0 inches.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.2	Verify, for each required core spray (CS) subsystem, the: a. Suppression pool water level is ≥ 20 ft 0 inches; or b. ----------NOTE---------- Only one required CS subsystem may take credit for this option during OPDRVs. ---------- Condensate storage tank water level is ≥ 49% of capacity.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.5.2.3	Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.5.2.4	----------NOTE---------- LPCI subsystems may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. ---------- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF CS / ≥ 6350 gpm / 2 / ≥ 105 psig LPCI / ≥ 12,200 gpm / 1 / ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.2.6	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.5.2.7	----------NOTE---------- Instrumentation response time may be assumed to be the historical instrumentation response time. ---------- Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limit.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, and the RCIC flow controller are in the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.5.3.3	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----------	
	Verify, with reactor pressure ≤ 1060 psig and ≥ 920 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Inservice Testing Program
SR 3.5.3.4	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----------	
	Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	----------NOTE---------- Vessel injection may be excluded. ---------- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program.
SR 3.6.1.1.2	Verify that the drywell-to-suppression chamber bypass leakage is less than 0.00535 ft^2 at an initial differential pressure of $\geq$ 4.3 psi.	When performing 10 CFR 50 Appendix J, Type A testing, in accordance with the Primary Containment Leakage Rate Testing Program. AND ----------Note---------- Only required after two consecutive tests fail and continues until two consecutive tests pass ---------- In accordance with the Surveillance Frequency Control Program ~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.3	----------Note---------- Satisfied by the performance of SR 3.6.1.1.2. ----------	
	Verify that the total drywell-to-suppression chamber vacuum breaker leakage is less than or equal to .001605 ft^2 and the leakage area for each set of vacuum breakers is less than or equal to .000642 ft^2 at an initial differential pressure of $\geq$ 4.3 psi.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	----------NOTES---------- 1. Only required to be met in MODES 1, 2, and3. 2. Not required to be met when the 18 and 24 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. ----------	
	Verify each 18 and 24 inch primary containment purge valve is closed.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.1.3.2	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. ----------	
	Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.3	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. ---------- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity for each of the traversing incore probe (TIP) shear isolation valve explosive charge.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.1.3.5	Verify the isolation time of each power operated and each automatic PCIV, except for MSIVs, is within limits.	In accordance with the Inservice Testing Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.6	----------NOTE---------- Only required to be met in MODES 1, 2 and 3. ---------- Perform leakage rate testing for each primary containment purge valve with resilient seals.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.6.1.3.7	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.6.1.3.8	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.6.1.3.9	Verify a representative sample of reactor instrumentation line EFCVs actuate to check flow on a simulated instrument line break.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.10	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.1.3.11	----------NOTES---------- Only required to be met in MODES 1, 2, and 3. ---------- Verify the combined leakage rate for all secondary containment bypass leakage paths is ≤ 15 scfh when pressurized to ≥ P_a.	In accordance with the Primary Containment Leakage Rate Testing Program.
SR 3.6.1.3.12	----------NOTES---------- Only required to be met in MODES 1, 2, and 3. ---------- Verify leakage rate through each MSIV is ≤ 100 scfh and ≤300 scfh for the combined leakage including the leakage from the MS Line Drains, when the MSIVs are tested at ≥ 24.3 psig or P_a and the MS Line Drains are tested at P_a.	In accordance with the Primary Containment Leakage Rate Testing Program.

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.4 Containment Pressure

LCO 3.6.1.4 Containment pressure shall be -1.0 to 2.0 psig.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limit	A.1 Restore containment pressure to within limit.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.4.1 Verify containment pressure is within limit.	In accordance with the Surveillance Frequency Control Program ~~12 hours~~

3.6 CONTAINMENT SYSTEMS

3.6.1.5 Drywell Air Temperature

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

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	Verify drywell average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	----------NOTE---------- Not required to be met for vacuum breakers that are open during Surveillances. ---------- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program~~14 days~~ AND Within 2 hours after discharge of steam to the suppression chamber from safety/relief valve (S/RV) operation.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the Surveillance Frequency Control Program~~31 days~~ AND Within 12 hours after discharge of steam to the suppression chamber from S/RV operation AND Within 12 hours following an operation that causes any of the vacuum breakers to open
SR 3.6.1.6.3	Verify the opening setpoint of each required vacuum breaker is ≥ 0.25 and ≤ .75 psid.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Suppression pool average temperature > 120°F.	E.1 Depressurize the reactor vessel to < 200 psig.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.1.1 Verify suppression pool average temperature is within the applicable limits.	In accordance with the Surveillance Frequency Control Program ~~24 hours~~ AND 5 minutes when performing testing that adds heat to the suppression pool

3.6 CONTAINMENT SYSTEMS

3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be ≥ 22 ft 0 inches and ≤ 24 ft 0 inches.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.2.1 Verify suppression pool water level is within limits.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate > 9750 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.2.4.2	Verify each suppression pool spray is unobstructed.	In accordance with the Surveillance Frequency Control Program~~10 years~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.3.2.1 Operate each required drywell cooling fan at low speed for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program~~92 days~~

3.6 CONTAINMENT SYSTEMS

3.6.3.3 Primary Containment Oxygen Concentration

LCO 3.6.3.3 The primary containment oxygen concentration shall be < 4.0 volume percent.

APPLICABILITY: MODE 1 during the time period:

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

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.3.3.1 Verify primary containment oxygen concentration is within limits.	In accordance with the Surveillance Frequency Control Program~~7 days~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Secondary containment inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	C.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	C.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	C.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify secondary containment vacuum is ≥ 0.25 inch of vacuum water gauge.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.6.4.1.2	Verify all required secondary containment removable walls and equipment hatches required to be closed are closed and sealed.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
	----------NOTE---------- Single door access openings between required zones within the secondary containment boundary may be opened for entry and exit. ----------	
SR 3.6.4.1.3	Verify one secondary containment access door in each access opening is closed.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.4.1.4	----------NOTE---------- The maximum time allowed for secondary containment draw down is dependent on the secondary containment configuration. ----------	----------NOTE---------- Test each configuration at least one time every 60 months. ----------
	Verify each standby gas treatment (SGT) subsystem will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in less than or equal to the maximum time allowed for the secondary containment configuration that is OPERABLE.	In accordance with the Surveillance Frequency Control Program ~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.4.1.5	----------NOTE---------- The maximum flow allowed for maintaining secondary containment vacuum is dependent on the secondary containment configuration. ----------	----------NOTE---------- Test each configuration at least one time every 60 months. ----------
	Verify each SGT subsystem can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment for at least 1 hour at a flow rate less than or equal to the maximum flow rate permitted for the secondary containment configuration that is OPERABLE.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for SCIVs that are open under administrative controls. ----------	
	Verify each required secondary containment isolation manual valve and blind flange that is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.6.4.2.2	Verify the isolation time of each required automatic SCIV is within limits.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.6.4.2.3	Verify each required automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two SGT subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	F.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	AND	
	F.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	F.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT filter train for ≥ 10 continuous hours with heaters operating.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.6.4.3.4	Verify each SGT filter cooling bypass and outside air damper opens and the fan starts on high charcoal temperature.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify the water level is greater than or equal to 678 feet 1 inch above Mean Sea Level.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.7.1.2	Verify the average water temperature of the UHS is: a. ----------NOTE---------- Only applicable with both units in MODE 1 or 2, or with either unit in MODE 3 for less than twelve (12) hours. ---------- ≤ 85°F; or b. ----------NOTE---------- Only applicable when either unit has been in MODE 3 for at least twelve (12) hours but not more than twenty-four (24) hours. ---------- ≤ 87°F; or c. ----------NOTE---------- Only applicable when either unit has been in MODE 3 for at least twenty-four (24) hours. ---------- ≤ 88°F	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.7.1.3	Verify each RHRSW manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	~~31 days~~In accordance with the Surveillance Frequency Control Program
SR 3.7.1.4	Verify that valves HV-01222A and B (the spray array bypass valves) close upon receipt of a closing signal and open upon receipt of an opening signal.	In accordance with the Surveillance Frequency Control Program~~92 days~~

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.5	Verify that valves HV-01224A1 and B1 (the large spray array valves) close upon receipt of a closing signal and open upon receipt of an opening signal.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.7.1.6	Verify that valves HV-01224A2 and B2 (the small spray array valves) close upon receipt of a closing signal and open upon receipt of an opening signal.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.7.1.7	Verify that valves 012287A and 012287B (the spray array bypass manual valves) are capable of being opened and closed.	In accordance with the Surveillance Frequency Control Program~~92 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	----------NOTE---------- Isolation of flow to individual components does not render ESW System inoperable. ----------	
	Verify each ESW subsystem manual, power operated, and automatic valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.2.2	Verify each ESW subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CREOAS subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	F.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
OR	AND	
One or more CREOAS subsystems inoperable due to an inoperable CRE boundary during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	F.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	F.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREOAS filter train for ≥ 10 continuous hours with the heaters operable.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.3.2	Perform required CREOAS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.3.3	Verify each CREOAS subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two control room floor cooling subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	E.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	E.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	E.3 Initiate actions to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room floor cooling subsystem has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	----------NOTE---------- Not required to be performed until 31 days after any main steam line is not isolated ----------	
	Verify the radioactivity rate of the specified noble gases is ≤ 330 mCi/second.	In accordance with the Surveillance Frequency Control Program~~31 days~~ AND Once within 4 hours after a ≥ 50% increase in the nominal steady state fission gas release after factoring out increases due to changes in THERMAL POWER level

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify one complete cycle of each required main turbine bypass valve.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.6.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.7.6.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months~~

3.7 PLANT SYSTEMS

3.7.7 Spent Fuel Storage Pool Water Level

LCO 3.7.7 The spent fuel storage pool water level shall be ≥ 22 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify the spent fuel storage pool water level is ≥ 22 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	In accordance with the Surveillance Frequency Control Program~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that both Main Turbine Pressure Regulators are each capable of controlling main steam pressure.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.7.8.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program~~24 months~~

3.8 Electrical Power Systems

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two or more required DGs inoperable.	E.1 Restore at least three required DGs to OPERABLE status.	2 hours
F. Required Action and Associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	12 hours 36 hours
G. One or more offsite circuits and two or more required DGs inoperable. OR One required DG and two offsite circuits inoperable.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

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

Four DGs are required and a DG is only considered OPERABLE when the DG is aligned to the Class 1E distribution system. DG Surveillance Requirements have been modified to integrate the necessary testing to demonstrate the availability of DG E and ensure its OPERABILITY when substituted for any other DG. If the DG Surveillance Requirements, as modified by the associated Notes, are met and performed, DG E can be considered available and OPERABLE when substituted for any other DG after performance of SR 3.8.1.3 and SR 3.8.1.7.

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program~~7 days~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	Not Used.	
SR 3.8.1.3	----------NOTES---------- 1. DG loading may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.7. 5. DG E, when not aligned to the Class 1E distribution system, may satisfy this SR using the test facility. 6. A single test will satisfy this Surveillance for both units if synchronization is to the 4.16 kV ESS bus for Unit 1 for one periodic test and synchronization is to the 4.16 kV ESS bus for Unit 2 for the next periodic test. However, if it is not possible to perform the test on Unit 2 or test performance is not required per SR 3.8.2.1, then the test shall be performed synchronized to the 4.16 kV ESS bus for Unit 1. ----------	
	Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 3600 kW and ≤ 4000 kW.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.4	Verify each engine mounted day tank fuel oil level is ≥ 420 gallons for DG A-D and ≥ 425 gallons for DG E.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.5	Check for and remove accumulated water from each engine mounted day tank.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tanks to each engine mounted tank.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.7	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. A single test at the specified Frequency will satisfy this Surveillance for both units. ---------- Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3793 V and frequency ≥ 58.8, and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.8	----------NOTE---------- The automatic transfer of the unit power supply shall not be performed in MODE 1 or 2. ---------- Verify automatic and manual transfer of unit power supply from the normal offsite circuit to the alternate offsite circuit.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTE---------- A single test at the specified Frequency will satisfy this Surveillance for both units. ---------- 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. Within 4.5 seconds following load rejection, the voltage is ≥ 3760 V and ≤ 4560 V, and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V; and c. Within 6 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.8.1.10	----------NOTES---------- A single test at the specified Frequency will satisfy this Surveillance for both units. ---------- Verify each DG does not trip and voltage is maintained ≤ 4560 V during and following a load rejection of ≥ 4000 kW.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. 3. This Surveillance shall not be performed in MODE 1, 2 or 3. ----------	
	Verify on an actual or simulated loss of offsite power signal: a. De-energization of 4.16 kV ESS buses; b. Load shedding from 4.16 kV ESS 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 individual load timers, 3. maintains steady state voltage ≥ 3793 V and ≤ 4400 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. DG E, when not aligned to the Class 1E distribution system, may satisfy this SR for both units by performance of SR 3.8.1.12.a, b and c using the test facility to simulate a 4.16 kV ESS bus. SR 3.8.1.12.d and e may be satisfied with either the normally aligned DG or DG E aligned to the Class 1E distribution system. ---------- Verify, on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal, each DG auto-starts from standby condition and: a. In ≤ 10 seconds after auto-start achieves voltage ≥ 3793 V, and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V; b. In ≤ 10 seconds after auto-start achieves frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized or auto-connected through the individual load timers from the offsite power system.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTES---------- 1. A single test at the specified Frequency will satisfy this Surveillance for both units. 2. DG E, when not aligned to the Class 1E distribution system, may satisfy this SR for both units by using a simulated ECCS initiation signal. ---------- Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the 4.16 kV ESS bus concurrent with an actual or simulated ECCS initiation signal except: a. Engine overspeed; and b. Generator differential current; and c. Low lube oil pressure.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load ranges do not invalidate this test. 2. A single test at the specified Frequency will satisfy this Surveillance for both units. 3. DG E, when not aligned to the Class 1E distribution system may satisfy this SR by using the test facility. ----------	
	Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 4400 kW and ≤ 4700 kW for DGs A through D and ≥ 5000 kW and ≤ 5500 kW for DG E; and b. For the remaining hours of the test loaded ≥ 3600 kW and ≤ 4000 kW for DGs A through D and ≥ 4500 kW and ≤ 5000 kW for DG E.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

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 ≥ 3800 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. 3. A single test at the specified Frequency will satisfy this Surveillance for both units. ----------	
	Verify each DG starts and achieves, in ≤ 10 seconds, voltage ≥ 3793 V and frequency ≥ 58.8 and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.16	----------NOTES---------- This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. ----------	
	Verify each DG:	In accordance with the Surveillance Frequency Control Program~~24 months~~
	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.	

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTES---------- This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. ----------	
	Verify with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.8.1.18	----------NOTE---------- Load timers associated with equipment that has automatic initiation capability disabled are not required to be OPERABLE. ----------	
	Verify each sequenced load is within required limits of the design interval.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. 3. This Surveillance shall not be performed in MODE 1, 2 or 3. ----------	
	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of 4.16 kV ESS buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual load timers, 3. achieves steady state voltage ≥ 3793 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR does not have to be performed with DG E substituted for any DG. ----------	
	Verify, when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 3793 V and frequency ≥ 58.8 and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~10 years~~

ACTIONS (continued)
SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 47,570 gallons for DG A-D; ≥ 60,480 gallons for DG E.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.3.2	Verify lube oil sump level is visible in the sight glass.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	----------NOTE---------- Not required to be met when DG is operating. ---------- Verify each DG air start receiver pressure is ≥ 240 psig.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	In accordance with the Surveillance Frequency Control Program~~31 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Diesel Generator E DC electrical power subsystem inoperable, when not aligned to the Class 1E distribution system.	E.1 Verify that all ESW valves associated with Diesel Generator E are closed.	2 hours
F. Diesel Generator E DC electrical power subsystem inoperable, when aligned to the Class 1E distribution system.	F.1 Declare Diesel Generator E inoperable.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.8.4.2	Verify each required battery charger supplies its associated battery at the following rates for ≥ 4 hours at greater than or equal to the minimum established float voltages. a. ≥ 100 amps for the 125V Battery b. ≥ 300 amps for the 250V Battery c. ≥ 200 amps for the 125V Diesel Generator E Battery	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.3	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not be Performed in Mode 1, 2, or 3 except for the Diesel Generator E DC electrical power subsystem. This Surveillance can be performed on the Diesel Generator E DC electrical power subsystem when the Diesel Generator E is not aligned to the Class 1E distribution system. However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 2 amps.	In accordance with the Surveillance Frequency Control Program~~7 days~~ ~~NOTE The 7 day Frequency is not applicable if the battery is on equalize charge or has been on equalize charge at any time during the previous 4 days.~~ ~~AND~~ ~~14 days~~
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.8.6.6	----------NOTE---------- This Surveillance shall not be Performed in Mode 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. ----------	
	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~~ AND 12 months when battery shows degradation or has reached 85% of expected service life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected service life with capacity ≥ 100% of manufacturer's rating

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct breaker alignments and voltage or indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program~~7 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Diesel Generator E DC electrical power distribution subsystem inoperable, while not aligned to the Class 1E distribution system.	B.1 Verify that all ESW valves associated with Diesel Generator E are closed.	2 hours
C. Diesel Generator E DC electrical power distribution subsystem inoperable, while aligned to the Class 1E distribution system.	C.1 Declare Diesel Generator E inoperable.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and voltage or indicated power availability to required AC and DC electrical power distribution subsystems.	~~7 days~~In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform fuel grapple, fuel loaded, d. Refuel platform frame mounted hoist, fuel loaded, e. Refuel platform monorail mounted hoist, fuel loaded.	In accordance with the Surveillance Frequency Control Program~~7 days~~

3.9 REFUELING OPERATIONS

3.9.2 Refuel Position One-Rod-Out Interlock

LCO 3.9.2 The refuel position one-rod-out interlock shall be OPERABLE.

APPLICABILITY: MODE 5 with the reactor mode switch in the refuel position and any control rod withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refuel position one-rod-out interlock inoperable.	A.1 Suspend control rod withdrawal.	Immediately
	AND	
	A.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in Refuel position.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.9.2.2	----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn. ---------- Perform CHANNEL FUNCTIONAL TEST.	 In accordance with the Surveillance Frequency Control Program~~7 days~~

3.9 REFUELING OPERATIONS

3.9.3 Control Rod Position

LCO 3.9.3 All control rods shall be fully inserted.

APPLICABILITY: When loading fuel assemblies into the core.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more control rods not fully inserted.	A.1 Suspend loading fuel assemblies into the core.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.3.1 Verify all control rods are fully inserted.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

3.9 REFUELING OPERATIONS

3.9.5 Control Rod OPERABILITY—Refueling

LCO 3.9.5 Each withdrawn control rod shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more withdrawn control rods inoperable.	A.1 Initiate action to fully insert inoperable withdrawn control rods.	Immediately

SURVEILLANCE REQUIREMENTS

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

3.9 REFUELING OPERATIONS

3.9.6 Reactor Pressure Vessel (RPV) Water Level

LCO 3.9.6 RPV water level shall be ≥ 22 ft above the top of the RPV flange.

APPLICABILITY: During movement of irradiated fuel assemblies within the RPV,

During movement of new or irradiated fuel assemblies or handling of control rods within the RPV, when irradiated fuel assemblies are seated within the RPV.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RPV water level not within limit.	A.1 Suspend movement of fuel assemblies and handling of control rods within the RPV.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	~~12 hours~~In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3.1 Place the reactor mode switch in the shutdown position. OR A.3.2 ----------NOTE---------- Only applicable in MODE 5 ---------- Place the reactor mode switch in the refuel position.	1 hour 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more of the above requirements not met with the affected control rod not insertable.	B.1 Suspend withdrawal of the control rod and removal of associated CRD.	Immediately
	AND	
	B.2.1 Initiate action to fully insert all control rods.	Immediately
	OR	
	B.2.2 Initiate action to satisfy the requirements of this LCO.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	----------NOTE---------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. ---------- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.4.4	----------NOTE---------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. ---------- Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Initiate action to fully insert all control rods. OR A.2.2 Initiate action to satisfy the requirements of this LCO.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.10.5.5 Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3.1 Initiate action to fully insert all control rods in core cells containing one or more fuel assemblies. OR	Immediately
	A.3.2 Initiate action to satisfy the requirements of this LCO.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS (continued)

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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

5.5 Programs and Manuals

5.5.14 Control Room Envelope Habitability Program (continued)

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

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

5.5.15 Surveillance Frequency Control Program

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

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

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

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

1.1 Definitions (continued)

RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3952 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical assuming that: a. The reactor is xenon free; b. The moderator temperature is 68°F; and c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.
~~STAGGERED TEST BASIS~~	~~A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.~~
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TURBINE BYPASS SYSTEM RESPONSE TIME	The TURBINE BYPASS SYSTEM RESPONSE TIME consists of the time from when the turbine bypass control unit generates a turbine bypass valve flow signal

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	In accordance with the Surveillance Frequency Control Program ~~24 hours~~
SR 3.1.3.2	NOT USED	
SR 3.1.3.3	----------NOTE---------- Not required to be performed until 31 days after the control rod is withdrawn and THERMAL POWER is greater than the LPSP of the RWM. ----------	
	Insert each withdrawn control rod at least one notch.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.1.3.4	Verify each control rod scram time from fully withdrawn to notch position 05 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	In accordance with the Surveillance Frequency Control Program ~~200 days cumulative operation in MODE 1~~
SR 3.1.4.3	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with any reactor steam dome pressure.	Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect scram time
SR 3.1.4.4	Verify each affected control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure ≥ 800 psig.	Prior to exceeding 40% RTP after fuel movement within the affected core cell AND Prior to exceeding 40% RTP after work on control rod or CRD System that could affect scram time

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more control rod scram accumulators inoperable with reactor steam dome pressure < 900 psig.	C.1 Verify all control rods associated with inoperable accumulators are fully inserted.	Immediately upon discovery of charging water header pressure < 940 psig
	AND	
	C.2 Declare the associated control rod inoperable.	1 hour
D. Required Action and associated Completion Time of Required Action B.1 or C.1 not met.	D.1 ----------NOTE---------- Not applicable if all inoperable control rod scram accumulators are associated with fully inserted control rods. ---------- Place the reactor mode switch in the shutdown position.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each control rod scram accumulator nitrogen pressure is ≥ 940 psig.	In accordance with the Surveillance Frequency Control Program~~7 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Nine or more OPERABLE control rods not in compliance with BPWS.	B.1 ----------NOTE---------- Rod worth minimizer (RWM) may be bypassed as allowed by LCO 3.3.2.1. ---------- Suspend withdrawal of control rods.	Immediately
	AND	
	B.2 Place the reactor mode switch in the shutdown position.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify all OPERABLE control rods comply with BPWS.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution is within the limits of Figure 3.1.7-1.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.1.7.2	Verify temperature of sodium pentaborate solution is within the limits of Figure 3.1.7-2.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.1.7.3	Verify temperature of pump suction piping is within the limits of Figure 3.1.7-2.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.1.7.4	Verify continuity of explosive charge.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.1.7.5	Verify the concentration of sodium pentaborate in solution is within the limits of Figure 3.1.7-1 .	In accordance with the Surveillance Frequency Control Program~~31 days~~ AND Once within 24 hours after water or sodium pentaborate is added to solution AND Once within 24 hours after solution temperature is restored within the limits of Figure 3.1.7-2

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.6	Verify each SLC subsystem manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 40.0 gpm at a discharge pressure ≥ 1250 psig.	In accordance with the Inservice Testing Program
SR 3.1.7.8	Verify flow through one SLC subsystem pump into reactor pressure vessel.	~~24 months on a STAGGERED TEST BASIS~~In accordance with the Surveillance Frequency Control Program
SR 3.1.7.9	Verify all heat traced piping between storage tank and pump suction is unblocked.	~~24 months~~In accordance with the Survellance Frequency Control Program AND Once within 24 hours after solution temperature is restored within the limits of Figure 3.1.7-2
SR 3.1.7.10	Verify sodium pentaborate enrichment is ≥ 88 atom percent B-10.	Prior to addition to SLC tank.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	----------NOTE---------- Not required to be met on vent and drain valves closed during performance of SR 3.1.8.2. ----------	
	Verify each SDV vent and drain valve is open.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.1.8.2	Cycle each SDV vent and drain valve to the fully closed and fully open position.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.1.8.3	Verify each SDV vent and drain valve: a. Closes in ≤ 30 seconds after receipt of an actual or simulated scram signal; and b. Opens when the actual or simulated scram signal is reset.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 24 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program~~24 hours thereafter~~ AND Prior to exceeding 44% RTP

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 24 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program~~24 hours thereafter~~ AND Prior to exceeding 44% RTP
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SRs in 3.1.4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR.	Once within 24 hours after ≥ 23% RTP AND In accordance with the Surveillance Frequency Control Program~~24 hours thereafter~~ AND Prior to exceeding 44% RTP

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.1.1.2	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.3.1.1.3	----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP. ----------	
	Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP while operating at ≥ 23% RTP.	In accordance with the Surveillance Frequency Control Program~~7 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.4	----------NOTE---------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.3.1.1.6	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to fully withdrawing SRMs from the core.
SR 3.3.1.1.7	----------NOTE---------- Only required to be met during entry into MODE 2 from MODE 1. ---------- Verify the IRM and APRM channels overlap.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.3.1.1.8	Calibrate the local power range monitors.	In accordance with the Surveillance Frequency Control Program~~1000 MWD/MT average core exposure~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.9	----------NOTE---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.1.1.10	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.1.1.11	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Function 1.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~184 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.12	----------NOTES---------- 1. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. 2. For Functions 2.b and 2.f, the CHANNEL FUNCTIONAL TEST includes the recirculation flow input processing, excluding the flow transmitters. ---------- Perform CHANNEL FUNCTIONAL TEST	In accordance with the Surveillance Frequency Control Program~~184 days~~
SR 3.3.1.1.13	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.14	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.15	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.16	Verify Turbine Stop Valve—Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.17	----------NOTES---------- 1. Neutron detectors are excluded. ~~2. For Function 5, "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency.~~ ~~3. For Function 2.e, "n" equals 8 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. Testing of APRM and OPRM outputs shall alternate.~~ ----------	
	Verify the RPS RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~
SR 3.3.1.1.18	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Functions 2b and 2.f, the recirculation flow transmitters that feed the APRMs are included. ----------	
	Perform CHANNEL CALIBRATION	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.1.1.19	Verify OPRM is not bypassed when APRM Simulated Thermal Power is ≥ 25% and recirculation drive flow is ≤ value equivalent to the core flow value defined in the COLR.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.20	Adjust recirculation drive flow to conform to reactor core flow.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2.4	----------NOTE---------- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. ---------- Verify count rate is: a. ≥ 3.0 cps if a signal to noise ratio ≥ 2:1 or b. Within the limits of Figure 3.3.1.2-1	12 hours during CORE ALTERATIONS AND In accordance with the Surveillance Frequency Control Program ~~24 hours~~
SR 3.3.1.2.5	Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.3.1.2.6	----------NOTE---------- Not required to be performed until 12 hours after IRMs on Range 2 or below. ---------- Perform CHANNEL FUNCTIONAL TEST and determination of signal to noise ratio.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.3.1.2.7	----------NOTES---------- 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.
2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~184 days~~
SR 3.3.2.1.2	----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.2.1.3	----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.2.1.4	Verify the RBM:	
	a. Low Power Range – Upscale Function is not bypassed when APRM Simulated Thermal Power is ≥ 28% RTP and ≤ Intermediate Power Range Setpoint specified in the COLR.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
	b. Intermediate Power Range – Upscale Function is not bypassed when APRM Simulated Thermal Power is > Intermediate Power Range Setpoint specified in the COLR and ≤ High Power Range Setpoint specified in the COLR. c. High Power Range – Upscale Function is not bypassed when APRM Simulated Thermal Power > High Power Range Setpoint specified in the COLR.	
SR 3.3.2.1.5	Verify the RWM is not bypassed when THERMAL POWER is ≤ 10% RTP.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.1.6	----------NOTE---------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.1.7	----------NOTE---------- Neutron detectors are excluded. ---------- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.1.8	Verify control rod sequences input to the RWM are in conformance with BPWS.	Prior to declaring RWM OPERABLE following loading of sequence into RWM

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.3.2.2.2	---------- 1. A test of all required contacts does not have to be performed. 2. For the Feedwater - Main Turbine High Water Level Function, a test of all required relays does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 55.5 inches.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1	Enter the Condition referenced in Table 3.3.3.1-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3.1-1.	E.1	Be in MODE 3.	12 hours
F. As required by Required Action D.1and referenced in Table 3.3.3.1-1.	F.1	Initiate action in accordance with Specification 5.6.7.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE	FREQUENCY
SR 3.3.3.1.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.3.3.1.2 Not Used.	
SR 3.3.3.1.3 Perform CHANNEL CALIBRATION for all Functions except PCIV Position.	~~24 months~~In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

Refer to Table 3.3.3.2-1 to determine which SRs apply for each Remote Shutdown System Function.

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.3.3.2.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.3.2.3	Perform CHANNEL CALIBRATION for each required instrumentation channel.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.4.1.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV—Closure: ≤ 7% closed; and TCV Fast Closure, Trip Oil Pressure—Low: ≥ 460 psig.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.4.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.4.1.4	Verify TSV—Closure and TCV Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is ≥ 26% RTP.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.5	----------NOTE---------- Breaker arc suppression time may be assumed from the most recent performance of SR 3.3.4.1.6. ---------- Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~
SR 3.3.4.1.6	Determine RPT breaker arc suppression time.	In accordance with the Surveillance Frequency Control Program~~60 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Function with ATWS-RPT trip capability not maintained.	B.1 Restore ATWS-RPT trip capability.	72 hours
C. Both Functions with ATWS-RPT trip capability not maintained.	C.1 Restore ATWS-RPT trip capability for one Function.	1 hour
D. Required Action and associated Completion Time not met.	D.1 Remove the associated recirculation pump from service. OR D.2 Be in MODE 2.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE	FREQUENCY
SR 3.3.4.2.1 Perform CHANNEL CHECK of Reactor Vessel Water Level, Low Low, Level 2.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.4.2.2	---------- A test of all required contacts does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.4.2.3	Perform CHANNEL CALIBRATION of the Reactor Steam Dome Pressure—High. The Allowable Values shall be ≤ 1150 psig.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.4.2.4	Perform CHANNEL CALIBRATION of the Reactor Vessel Water Level Low Low, Level 2. The Allowable Values shall be ≥ - 45 inches.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.4.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.5.1.2	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.5.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.5.2.2	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.5.2.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.5.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.6.1.2	---------- 1. A test of all required contacts does not have to be performed 2. For Functions 2.e, 3.a, and 4.a, a test of all required relays does not have to be performed ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.6.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.6	----------NOTE---------- 1. For Function 1.b. channel sensors are excluded. 2. Response time testing of isolating relays is not required for Function 5.a. ---------- Verify the ISOLATION SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.6.2.2	---------- A test of all required contacts does not have to be performed. ---------- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.2.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.3.6.2.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.6.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

~~ACTIONS~~
SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program ~~12 hours~~
SR 3.3.7.1.2	---------- 1. A test of all required contacts does not have to be performed. 2. For Function 8, a test of all required relays does not have to be performed. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~92 days~~
SR 3.3.7.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program ~~92 days~~
SR 3.3.7.1.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.3.7.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program ~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.8.1-1.	D.1 Restore the inoperable Channel.	1 hour
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1 Declare associated diesel generator (DG) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

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

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

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.3.8.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.3.8.1.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.8.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5.	D.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately
	AND	
	D.2.1 Initiate action to restore one electric power monitoring assembly to OPERABLE status for inservice power supply(s) supplying required instrumentation.	Immediately
	OR	
	D.2.2 Initiate action to isolate the Residual Heat Removal Shutdown Cooling System.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.2.1	----------NOTE---------- Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~184 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.3.8.2.2 Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 129.1 V for Division A and ≤ 130.3 V for Division B. b. Undervoltage ≥ 112.0 V for Division A and ≥ 112.5 V for Division B. c. Underfrequency ≥ 57 Hz.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.3.8.2.3 Perform a system functional test.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR	3.4.1.1	----------NOTE---------- Not required to be performed until 24 hours after both recirculation loops are in operation. ---------- Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10 million lbm/hr when operating at < 75 million lbm/hr total core flow; and b. ≤ 5 million lbm/hr when operating at ≥ 75 million lbm/hr total core flow.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR	3.4.1.2	----------NOTE---------- Only required to be met during single loop operations. ---------- Verify recirculation pump speed is within the limit specified in the LCO.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR	3.4.2.1	----------NOTES---------- 1. Not required to be completed until 4 hours after associated recirculation loop is in operation. 2. Not required to be completed until 24 hours after > 23% RTP. ----------	
		Verify at least two of the following criteria (a, b, or c) are satisfied for each operating recirculation loop: a. Recirculation loop drive flow versus Recirculation Pump speed differs by ≤ 10% from established patterns. b. Recirculation loop drive flow versus total core flow differs by ≤ 10% from established patterns. c. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns, or each jet pump flow differs by ≤ 10% from established patterns.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Verify source of unidentified LEAKAGE increase is not service sensitive type 304 or type 316 austenitic stainless steel.	4 hours
A. Required Action and associated Completion Time of Condition A or B not met. OR Pressure boundary LEAKAGE exists.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increases are within limits.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Perform a CHANNEL CHECK of required primary containment atmospheric monitoring system.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.4.6.2	Perform a CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.4.6.3	Perform a CHANNEL CALIBRATION of required leakage detection instrumentation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2.2.1 Be in MODE 3.	12 hours
	AND	
	B.2.2.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity is ≤ 0.2 μCi/gm.	In accordance with the Surveillance Frequency Control Program~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	----------NOTE---------- Not required to be met until 2 hours after reactor steam dome pressure is less than the RHR cut in permissive pressure. ---------- Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	 In accordance with the Surveillance Frequency Control Program~~12 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No RHR shutdown cooling subsystem in operation. AND No recirculation pump in operation.	B.1 Verify reactor coolant circulating by an alternate method.	1 hour from discovery of no reactor coolant circulation AND Once per 12 hours thereafter
	AND B.2 Monitor reactor coolant temperature.	Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS		
	SURVEILLANCE	FREQUENCY
SR 3.4.10.1	----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---------- Verify: a. RCS pressure and RCS temperature are to the right of the most limiting curve specified in Figures 3.4.10-1 through 3.4.10-3; and b. ----------NOTE---------- Only applicable when governed by Figure 3.4.10-2, Curve B, and Figure 3.4.10-3, Curve C. ---------- RCS heatup and cooldown rates are ≤ 100°F in any one hour period; and c. ----------NOTE---------- Only applicable when governed by Figure 3.4.10-1, Curve A. ---------- RCS heatup and cooldown rates are ≤ 20°F in any one hour period.	<u>In accordance with the Surveillance Frequency Control Program</u>~~30 minutes~~
SR 3.4.10.2	Verify RCS pressure and RCS temperature are to the right of the criticality limit (Curve C) specified in Figure 3.4.10-3.	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.10.6	----------NOTE---------- Only required to be met in single loop operation when the idle recirculation loop is not isolated from the RPV, and: a. THERMAL POWER ≤ 27% RTP; or b. The operating recirculation loop flow ≤ 21,320 gpm. ---------- Verify the difference between the reactor coolant temperature in the recirculation loop not in operation and the RPV coolant temperature is ≤ 50°F.	Once within 15 minutes prior to an increase in THERMAL POWER or an increase in loop flow.
SR 3.4.10.7	----------NOTE---------- Only required to be performed when tensioning the reactor vessel head bolting studs. ---------- Verify reactor vessel flange and head flange temperatures are ≥ 70°F.	In accordance with the Surveillance Frequency Control Program~~30 minutes~~
SR 3.4.10.8	----------NOTE---------- Not required to be performed until 30 minutes after RCS temperature ≤ 80°F in MODE 4. ---------- Verify reactor vessel flange and head flange temperatures are ≥ 70°F.	In accordance with the Surveillance Frequency Control Program~~30 minutes~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.10.9	----------NOTE---------- Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. ---------- Verify reactor vessel flange and head flange temperatures are ≥ 70°F.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Reactor Steam Dome Pressure

LCO 3.4.11 The reactor steam dome pressure shall be ≤ 1050 psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify reactor steam dome pressure is ≤ 1050 psig.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.2	----------NOTE---------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) cut in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. ----------	
	Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, and the HPCI flow controller are in the correct position.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.3	Verify ADS gas supply header pressure is ≥ 135 psig.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.4	Verify at least one RHR System cross tie valve is closed and power is removed from the valve operator.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.1.5	Verify each 480 volt AC swing bus transfers automatically from the normal source to the alternate source on loss of power.	In accordance with the Surveillance Frequency Control Program ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.9	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 165 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.1.10	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.1.11	----------NOTE---------- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.1.12	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each ADS valve opens when manually actuated.	In accordance with the Surveillance Frequency Control Program ~~24 months on a STAGGERED TEST BASIS for each valve solenoid~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.13	----------NOTE---------- Instrumentation response time is based on historical response time data. ---------- Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limit.	In accordance with the Surveillance Frequency Control Program ~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action C.2 and associated Completion Time not met.	D.1 Initiate action to restore secondary containment to OPERABLE status.	Immediately
	AND	
	D.2 Initiate action to restore one standby gas treatment subsystem to OPERABLE status.	Immediately
	AND	
	D.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ 20 ft 0 inches.	In accordance with the Surveillance Frequency Control Program ~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.2	Verify, for each required core spray (CS) subsystem, the: a. Suppression pool water level is ≥ 20 ft 0 inches; or b. ----------NOTE---------- Only one required CS subsystem may take credit for this option during OPDRVs. ---------- Condensate storage tank water level is ≥ 49% of capacity.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.5.2.3	Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.5.2.4	----------NOTE---------- LPCI subsystems may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. ---------- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF CS / ≥ 6350 gpm / 2 / ≥ 105 psig LPCI / ≥ 12,200 gpm / 1 / ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.2.6	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~
SR 3.5.2.7	----------NOTE---------- Instrumentation response time may be assumed to be the historical instrumentation response time. ---------- Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within limit.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, and the RCIC flow controller are in the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.5.3.3	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----------	
	Verify, with reactor pressure ≤ 1060 psig and ≥ 920 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Inservice Testing Program
SR 3.5.3.4	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----------	
	Verify, with reactor pressure ≤ 165 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	----------NOTE---------- Vessel injection may be excluded. ---------- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	In accordance with the Surveillance Frequency Control Program ~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program.
SR 3.6.1.1.2	Verify that the drywell-to-suppression chamber bypass leakage is less than 0.00535 ft^2 at an initial differential pressure of $\geq$4.3 psi.	When performing 10 CFR 50 Appendix J, Type A testing, in accordance with the Primary Containment Leakage Rate Testing Program. AND ----------Note---------- Only required after two consecutive tests fail and continues until two consecutive tests pass ---------- In accordance with the Surveillance Frequency Control Program ~~24 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.3	----------Note---------- Satisfied by the performance of SR 3.6.1.1.2. ----------	
	Verify that the total drywell-to-suppression chamber vacuum breaker leakage is less than or equal to .001605 ft^2 and the leakage area for each set of vacuum breakers is less than or equal to .000642 ft^2 at an initial differential pressure of $\geq$4.3 psi.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	12 hours
	AND	
	D.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.1	----------NOTE---------- 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 acceptable to SR 3.6.1.1.1. ----------	
	Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	----------NOTES---------- 1. Only required to be met in MODES 1, 2, and 3. 2. Not required to be met when the 18 and 24 inch primary containment purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. ---------- Verify each 18 and 24 inch primary containment purge valve is closed.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.1.3.2	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. ---------- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.3	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. ---------- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days
SR 3.6.1.3.4	Verify continuity for each of the traversing incore probe (TIP) shear isolation valve explosive charge.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.1.3.5	Verify the isolation time of each power operated and each automatic PCIV, except for MSIVs, is within limits.	In accordance with the Inservice Testing Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.6	----------NOTE---------- Only required to be met in MODES 1, 2 and 3. ---------- Perform leakage rate testing for each primary containment purge valve with resilient seals.	In accordance with the Surveillance Frequency Control Program ~~184 days~~24 ~~months~~
SR 3.6.1.3.7	Verify the isolation time of each MSIV is ≥3 seconds and ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.6.1.3.8	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.6.1.3.9	Verify a representative sample of reactor instrumentation line EFCVs actuate to check flow on a simulated instrument line break.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.6.1.3.10	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program ~~24 months on a STAGGERED TEST BASIS~~

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.4 Containment Pressure

LCO 3.6.1.4 Containment pressure shall be -1.0 to 2.0 psig.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limit	A.1 Restore containment pressure to within limit.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.4.1 Verify containment pressure is within limit.	In accordance with the Surveillance Frequency Control Program ~~12 hours~~

3.6 CONTAINMENT SYSTEMS

3.6.1.5 Drywell Air Temperature

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

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.5.1	Verify drywell average air temperature is within limit.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	----------NOTE---------- Not required to be met for vacuum breakers that are open during Surveillances. ---------- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program~~14 days~~ AND Within 2 hours after discharge of steam to the suppression chamber from safety/relief valve (S/RV) operation.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the Surveillance Frequency Control Program~~31 days~~ AND Within 12 hours after discharge of steam to the suppression chamber from S/RV operation AND Within 12 hours following an operation that causes any of the vacuum breakers to open
SR 3.6.1.6.3	Verify the opening setpoint of each required vacuum breaker is ≥ 0.25 and ≤ .75 psid.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Suppression pool average temperature > 120°F.	E.1 Depressurize the reactor vessel to < 200 psig.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.1.1 Verify suppression pool average temperature is within the applicable limits.	In accordance with the Surveillance Frequency Control Program ~~24 hours~~ AND 5 minutes when performing testing that adds heat to the suppression pool

3.6 CONTAINMENT SYSTEMS

3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be ≥ 22 ft 0 inches and ≤ 24 ft 0 inches.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.2.1 Verify suppression pool water level is within limits.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate > 9750 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.2.4.2	Verify each suppression pool spray is unobstructed.	In accordance with the Surveillance Frequency Control Program~~10 years~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.2.1	Operate each required drywell cooling fan at low speed for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program~~92 days~~

3.6 CONTAINMENT SYSTEMS

3.6.3.3 Primary Containment Oxygen Concentration

LCO 3.6.3.3 The primary containment oxygen concentration shall be < 4.0 volume percent.

APPLICABILITY: MODE 1 during the time period:

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

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
R 3.6.3.3.1 Verify primary containment oxygen concentration is within limits.	In accordance with the Surveillance Frequency Control Program~~7 days~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Secondary containment inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	C.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	C.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	C.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify secondary containment vacuum is ≥ 0.25 inch of vacuum water gauge.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.6.4.1.2	Verify all required secondary containment removable walls and equipment hatches required to be closed are closed and sealed.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
	----------NOTE---------- Single door access openings between required zones within the secondary containment boundary may be opened for entry and exit. ----------	
SR 3.6.4.1.3	Verify one secondary containment access door in each access opening is closed.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.4.1.4	----------NOTE---------- The maximum time allowed for secondary containment draw down is dependent on the secondary containment configuration. ----------	----------NOTE---------- Test each configuration at least one time every 60 months. ----------
	Verify each standby gas treatment (SGT) subsystem will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in less than or equal to the maximum time allowed for the secondary containment configuration that is OPERABLE.	In accordance with the Surveillance Frequency Control Program ~~24 months on a STAGGERED TEST BASIS~~
SR 3.6.4.1.5	----------NOTE---------- The maximum flow allowed for maintaining secondary containment vacuum is dependent on the secondary containment configuration. ----------	----------NOTE---------- Test each configuration at least one time every 60 months. ----------
	Verify each SGT subsystem can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment for at least 1 hour at a flow rate less than or equal to the maximum flow rate permitted for the secondary containment configuration that is OPERABLE.	In accordance with the Surveillance Frequency Control Program~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.2.1	----------NOTES---------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for SCIVs that are open under administrative controls. ---------- Verify each required secondary containment isolation manual valve and blind flange that is required to be closed during accident conditions is closed.	In accordance with the Surveillance Frequency Control Program ~~31 days~~
SR 3.6.4.2.2	Verify the isolation time of each required automatic SCIV is within limits.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.6.4.2.3	Verify each required automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two SGT subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	F.1 ----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	Suspend movement of irradiated fuel assemblies in secondary containment.	Immediately
	AND	
	F.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	F.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT filter train for ≥ 10 continuous hours with heaters operating.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.6.4.3.4	Verify each SGT filter cooling bypass and outside air damper opens and the fan starts on high charcoal temperature.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify the water level is greater than or equal to 678 feet 1 inch above Mean Sea Level.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.7.1.2	Verify the average water temperature of the UHS is: a. ----------NOTE---------- Only applicable with both units in MODE 1 or 2, or with either unit in MODE 3 for less than twelve (12) hours. ---------- ≤ 85°F; or b. ----------NOTE---------- Only applicable when either unit has been in MODE 3 for at least twelve (12) hours but not more than twenty-four (24) hours. ---------- ≤ 87°F; or c. ----------NOTE---------- Only applicable when either unit has been in MODE 3 for at least twenty-four (24) hours. ---------- ≤ 88°F.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.7.1.3	Verify each RHRSW manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.1.4	Verify that valves HV-01222A and B (the spray array bypass valves) close upon receipt of a closing signal and open upon receipt of an opening signal.	In accordance with the Surveillance Frequency Control Program~~92 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.1.5	Verify that valves HV-01224A1 and B1 (the large spray array valves) close upon receipt of a closing signal and open upon receipt of an opening signal.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.7.1.6	Verify that valves HV-01224A2 and B2 (the small spray array valves) close upon receipt of a closing signal and open upon receipt of an opening signal.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.7.1.7	Verify that valves 012287A and 012287B (the spray array bypass manual valves) are capable of being opened and closed.	In accordance with the Surveillance Frequency Control Program~~92 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B or C not met. OR Both ESW subsystems inoperable for reasons other than Condition A and B.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	----------NOTE---------- Isolation of flow to individual components does not render ESW System inoperable. ---------- Verify each ESW subsystem manual, power operated, and automatic valve in the flow paths servicing safety related systems or components, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.2.2	Verify each ESW subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CREOAS subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	F.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
OR	AND	
One or more CREOAS subsystems inoperable due to an inoperable CRE boundary during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	F.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	F.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Operate each CREOAS filter train for ≥ 10 continuous hours with the heaters operable.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.3.2	Perform required CREOAS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.3.3	Verify each CREOAS subsystem actuates on an actual or simulated initiation signal.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two control room floor cooling subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	E.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	E.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	E.3 Initiate actions to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify each control room floor cooling subsystem has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	----------NOTE---------- Not required to be performed until 31 days after any main steam line is not isolated. ----------	
	Verify the radioactivity rate of the specified noble gases is ≤ 330 mCi/second.	In accordance with the Surveillance Frequency Control Program~~31 days~~ AND Once within 4 hours after a ≥ 50% increase in the nominal steady state fission gas release after factoring out increases due to changes in THERMAL POWER level

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify one complete cycle of each required main turbine bypass valve.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.7.6.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.7.6.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program~~24 months~~

3.7 PLANT SYSTEMS

3.7.7 Spent Fuel Storage Pool Water Level

LCO 3.7.7 The spent fuel storage pool water level shall be ≥ 22 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify the spent fuel storage pool water level is ≥ 22 ft over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.	In accordance with the Surveillance Frequency Control Program~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that both Main Turbine Pressure Regulators are each capable of controlling main steam pressure.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.7.8.2	Perform a system functional test.	In accordance with the Surveillance Frequency Control Program~~24 months~~

SURVEILLANCE REQUIREMENTS

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

1. Four DGs are required and a DG is only considered OPERABLE when the DG is aligned to the Class 1E distribution system. DG Surveillance Requirements have been modified to integrate the necessary testing to demonstrate the availability of DG E and ensure its OPERABILITY when substituted for any other DG. If the DG Surveillance Requirements, as modified by the associated Notes, are met and performed, DG E can be considered available and OPERABLE when substituted for any other DG after performance of SR 3.8.1.3 and SR 3.8.1.7.

2. SR 3.8.1.21 establishes Surveillance Requirements for the Unit 1 AC sources required to support Unit 2.

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.8.1.2	Not Used.	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	----------NOTES---------- 1. DG loading may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.7. 5. DG E, when not aligned to the Class 1E distribution system, may satisfy this SR using the test facility. 6. A single test will satisfy this Surveillance for both units if synchronization is to the 4.16 kV ESS bus for Unit 2 for one periodic test and synchronization is to the 4.16 kV ESS bus for Unit 1 for the next periodic test. However, if it is not possible to perform the test on Unit 1 or test performance is not required per SR 3.8.2.1, then the test shall be performed synchronized to the 4.16 kV ESS bus for Unit 2. ----------	
	Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 3600 kW and ≤ 4000 kW.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.4	Verify each engine mounted day tank fuel oil level is ≥ 420 gallons for DG A-D and ≥ 425 gallons for DG E.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.5	Check for and remove accumulated water from each engine mounted day tank.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tanks to each engine mounted tank.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.7	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. A single test at the specified Frequency will satisfy this Surveillance for both units. ---------- Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3793 V and frequency ≥ 58.8, and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.1.8	----------NOTE---------- The automatic transfer of unit power supply shall not be performed in MODE 1 or 2. ---------- Verify automatic and manual transfer of unit power supply from the normal offsite circuit to the alternate offsite circuit. ----------	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTE---------- A single test at the specified Frequency will satisfy this Surveillance for both units. ---------- 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. Within 4.5 seconds following load rejection, the voltage is ≥ 3760 V and ≤ 4560 V, and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V; and c. Within 6 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.8.1.10	----------NOTE---------- A single test at the specified Frequency will satisfy this Surveillance for both units. ---------- Verify each DG does not trip and voltage is maintained ≤ 4560 V during and following a load rejection of ≥ 4000 kW.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.11 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2 or 3. 3. This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. ----------	
Verify on an actual or simulated loss of offsite power signal: a. De-energization of 4.16 kV ESS buses; b. Load shedding from 4.16 kV ESS 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 individual load timers, 3. maintains steady state voltage ≥ 3793 V and ≤ 4400 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.12 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. DG E, when not aligned to the Class 1E distribution system, may satisfy this SR for both units by performance of SR 3.8.1.12.a, b and c using the test facility to simulate a 4.16 kV ESS bus. SR 3.8.1.12.d and e may be satisfied with either the normally aligned DG or DG E aligned to the Class 1E distribution system. ----------	
Verify, on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal, each DG auto-starts from standby condition and: a. In ≤ 10 seconds after auto-start achieves voltage ≥ 3793 V, and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V; b. In ≤ 10 seconds after auto-start achieves frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized or auto-connected through the individual load timers from the offsite power system.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTES---------- 1. A single test at the specified Frequency will satisfy this Surveillance for both units. 2. DG E when not aligned to the Class 1E distribution system may satisfy this SR by using a simulated ECCS initiation signal. ----------	
	Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the 4.16 kV ESS bus concurrent with an actual or simulated ECCS initiation signal except: a. Engine overspeed; and b. Generator differential current; and c. Low lube oil pressure.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.14 ----------NOTES---------- 1. Momentary transients outside the load ranges do not invalidate this test. 2. A single test at the specified Frequency will satisfy this Surveillance for both units. 3. DG E when not aligned to the Class 1E distribution system may satisfy this SR using the test facility. ---------- Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 4400 kW and ≤ 4700 kW for DGs A through D and ≥ 5000 kW and ≤ 5500 kW for DG E; and b. For the remaining hours of the test loaded ≥ 3600 kW and ≤ 4000 kW for DGs A through D and ≥ 4500 kW and ≤ 5000 kW for DG E.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

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 ≥ 3800 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. 3. A single test at the specified Frequency will satisfy this Surveillance for both units. ----------	
	Verify each DG starts and achieves, in ≤ 10 seconds, voltage ≥ 3793 V and frequency ≥ 58.8 and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.16	----------NOTE---------- This SR shall be performed for each DG on a rotational basis and for each 4.16 kV ESS bus at the specified FREQUENCY. ----------	
	Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTES---------- This SR shall be performed for each DG on a rotational basis and for each 4.16 kV ESS bus at the specified FREQUENCY. ---------- Verify with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.8.1.18	----------NOTE---------- Load timers associated with equipment that has automatic initiation capability disabled are not required to be OPERABLE. ---------- Verify each sequenced load is within required limits of the design interval.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. 3. This Surveillance shall not be performed in MODE 1, 2 or 3. ----------	
Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of 4.16 kV ESS buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual load timers, 3. achieves steady state voltage ≥ 3793 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR must be met, but does not have to be performed with DG E substituted for any DG. ---------- Verify, when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 3793 V and frequency ≥ 58.8 and after steady state conditions are reached, maintains voltage ≥ 3793 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program~~10 years~~
SR 3.8.1.21	----------NOTE---------- When Unit 1 is in MODE 4 or 5, or moving irradiated fuel assemblies in the secondary containment, the Note to Unit 1 SR 3.8.2.1 is applicable. ---------- For required Unit 1 AC sources, the following SRs of Unit 1 Specification 3.8.1 are applicable: SR 3.8.1.1; SR 3.8.1.10; SR 3.8.1.3; SR 3.8.1.11; SR 3.8.1.4; SR 3.8.1.14; SR 3.8.1.5; SR 3.8.1.15; SR 3.8.1.6; SR 3.8.1.16; SR 3.8.1.7; SR 3.8.1.18; SR 3.8.1.9; SR 3.8.1.19; and SR 3.8.1.8 (when more than one Unit 1 offsite circuit is required)	In accordance with applicable SRs

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 47,570 gallons for DG A-D; ≥ 60,480 gallons for DG E.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.3.2	Verify lube oil sump level is visible in the sight glass.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	----------NOTE---------- Not required to be met when DG is operating. ----------	
	Verify each DG air start receiver pressure is ≥ 240 psig.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	In accordance with the Surveillance Frequency Control Program~~31 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.8.4.2	Verify each required battery charger supplies its associated battery at the following rates for ≥ 4 hours at greater than or equal to the minimum established float voltages: a) ≥ 100 amps for the 125V Battery b) ≥ 300 amps for the 250V Battery c) ≥ 200 amps for the125V Diesel Generator E Battery	In accordance with the Surveillance Frequency Control Program~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.3	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not be Performed in Mode 1, 2 or 3 except for the Diesel Generator E DC electrical power subsystem. This Surveillance can be performed on the Diesel Generator E DC electrical power subsystem when the Diesel Generator E is not aligned to the Class 1E distribution system. However, credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program~~24 months~~
SR 3.8.4.4	----------NOTE---------- When Unit 1 is in MODE 4 or 5, or moving irradiated fuel assemblies in the secondary containment, the Note to Unit 1 SR 3.8.5.1 is applicable. ----------	
	For required Unit 1 DC electrical power subsystems, the SRs for Unit 1 Specification 3.8.4 are applicable.	In accordance with applicable SRs

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 2 amps.	In accordance with the Surveillance Frequency Control Program~~7 days~~
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program~~31 days~~
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	In accordance with the Surveillance Frequency Control Program~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ 2.07 V.	In accordance with the Surveillance Frequency Control Program~~92 days~~
SR 3.8.6.6	----------NOTE---------- This Surveillance shall not be Performed in Mode 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. ----------	
	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~~ AND 12 months when battery shows degradation or has reached 85% of expected service life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected service life with capacity ≥ 100% of manufacturer's rating

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct breaker alignments and voltage or indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program~~7 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Diesel Generator E DC electrical power distribution subsystem inoperable, while not aligned to the Class 1E distribution system.	B.1 Verify that all ESW valves associated with Diesel Generator E are closed.	2 hours
C. Diesel Generator E DC electrical power distribution subsystem inoperable, while aligned to the Class 1E distribution system.	C.1 Declare Diesel Generator E inoperable.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and voltage or indicated power availability to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs: a. All-rods-in, b. Refuel platform position, c. Refuel platform fuel grapple, fuel loaded, d. Refuel platform frame mounted hoist, fuel loaded, e. Refuel platform monorail mounted hoist, fuel loaded.	In accordance with the Surveillance Frequency Control Program~~7 days~~

3.9 REFUELING OPERATIONS

3.9.2 Refuel Position One-Rod-Out Interlock

LCO 3.9.2 The refuel position one-rod-out interlock shall be OPERABLE.

APPLICABILITY: MODE 5 with the reactor mode switch in the refuel position and any control rod withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Refuel position one-rod-out interlock inoperable.	A.1 Suspend control rod withdrawal.	Immediately
	AND	
	A.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in Refuel position.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.9.2.2	----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn. ----------	
	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program~~7 days~~

3.9 REFUELING OPERATIONS

3.9.3 Control Rod Position

LCO 3.9.3 All control rods shall be fully inserted.

APPLICABILITY: When loading fuel assemblies into the core.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more control rods not fully inserted.	A.1 Suspend loading fuel assemblies into the core.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.3.1 Verify all control rods are fully inserted.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

3.9 REFUELING OPERATIONS

3.9.5 Control Rod OPERABILITY—Refueling

LCO 3.9.5 Each withdrawn control rod shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more withdrawn control rods inoperable.	A.1 Initiate action to fully insert inoperable withdrawn control rods.	Immediately

SURVEILLANCE REQUIREMENTS

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

3.9 REFUELING OPERATIONS

3.9.6 Reactor Pressure Vessel (RPV) Water Level

LCO 3.9.6 RPV water level shall be ≥ 22 ft above the top of the RPV flange.

APPLICABILITY: During movement of irradiated fuel assemblies within the RPV,

During movement of new or irradiated fuel assemblies or handling of control rods within the RPV, when irradiated fuel assemblies are seated within the RPV.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RPV water level not within limit.	A.1 Suspend movement of fuel assemblies and handling of control rods within the RPV.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 22 ft above the top of the RPV flange.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem is operating.	In accordance with the Surveillance Frequency Control Program~~12 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3.1 Place the reactor mode switch in the shutdown position.	1 hour
	OR	
	A.3.2 ----------NOTE---------- Only applicable in MODE 5 ----------	
	Place the reactor mode switch in the refuel position.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify all control rods are fully inserted in core cells containing one or more fuel assemblies.	In accordance with the Surveillance Frequency Control Program~~12 hours~~
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

SURVEILLANCE REQUIREMENTS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more of the above requirements not met with the affected control rod not insertable.	B.1 Suspend withdrawal of the control rod and removal of associated CRD.	Immediately
	AND	
	B.2.1 Initiate action to fully insert all control rods.	Immediately
	OR	
	B.2.2 Initiate action to satisfy the requirements of this LCO .	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.4.1	Perform the applicable SRs for the required LCOs.	According to the applicable SRs
SR 3.10.4.2	----------NOTE---------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.c.1 requirements. ---------- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.4.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.4.4	----------NOTE---------- Not required to be met if SR 3.10.4.1 is satisfied for LCO 3.10.4.b.1 requirements. ---------- Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Initiate action to fully insert all control rods. OR A.2.2 Initiate action to satisfy the requirements of this LCO.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.5.1	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.5.2	Verify all control rods, other than the control rod withdrawn for the removal of the associated CRD, in a five by five array centered on the control rod withdrawn for the removal of the associated CRD, are disarmed.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	In accordance with the Surveillance Frequency Control Program~~24 hours~~
SR 3.10.5.4	Perform SR 3.1.1.1.	According to SR 3.1.1.1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.10.5.5 Verify no CORE ALTERATIONS are in progress.	In accordance with the Surveillance Frequency Control Program~~24 hours~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3.1 Initiate action to fully insert all control rods in core cells containing one or more fuel assemblies. OR	Immediately
	A.3.2 Initiate action to satisfy the requirements of this LCO.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS (continued)

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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

5.5 Programs and Manuals

5.5.14 Control Room Envelope Habitability Program (continued)

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

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

5.5.15 Surveillance Frequency Control Program

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

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

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

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

Attachment 4 to PLA-7119

Markups of Existing Technical Specifications Bases

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1 (continued)

determined by the use of OPERABLE position indicators, by moving control rods to a position with an OPERABLE indicator, or by the use of other appropriate methods. ~~The 24 hour Frequency of this SR is based on operating experience related to expected changes in control rod position and the availability of control rod position indications in the control room.~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.3.2

NOT USED

SR 3.1.3.3

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

SR 3.1.3.4

Verifying that the scram time for each control rod to notch position 05 is $\leq$ 7 seconds provides reasonable assurance that the control rod will insert when required during a DBA or transient, thereby completing its shutdown function. This SR is performed in conjunction with the control rod scram time testing of SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4. The LOGIC SYSTEM FUNCTIONAL TEST in

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. The sample remains representative if no more than 7.5% of the control rods in the sample tested are determined to be "slow." With more than 7.5% of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 7.5% criterion (e.g., 7.5% of the entire sample size) is satisfied, or until the total number of "slow" control rods (throughout the core, from all surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. ~~The 200 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.1.4.3

When work that could affect the scram insertion time is performed on a control rod or the CRD System, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod OPERABLE. The required scram time testing must demonstrate the affected control rod is still within acceptable limits. The limits for reactor pressures < 800 psig are established based on a high probability of meeting the acceptance criteria at reactor pressures ≥ 800 psig. Limits for ≥ 800 psig are found in Table 3.1.4-1. If testing demonstrates the affected control rod does not meet these limits, but is within the 7-second limit of Table 3.1.4-1, Note 2, the control rod can be declared OPERABLE and "slow."

(continued)

BASES

ACTIONS

D.1 (continued)

the inoperable scram accumulators are fully inserted, since the function of the control rods has been performed.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

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

REFERENCES

1. FSAR, Section 4.3.2.
2. FSAR, Section 4.6.
3. FSAR, Section 15.
4. Final Policy Statement on Technical Specifications Improvements. July 22, 1993 (58 FR 39132).

BASES

ACTIONS

B.1 and B.2 (continued)

of a CRDA occurring with the control rods out of sequence.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

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

REFERENCES

1. XN-NF-80-19(P)(A) Volume 1 and Supplements 1 and 2, "Exxon Nuclear Methodology for Boiling Water Reactors," Exxon Nuclear Company, March 1983.

2. "Modifications to the Requirements for Control Rod Drop Accident Mitigating System," BWR Owners Group, July 1986.

3. NUREG-0979, Section 4.2.1.3.2, April 1983.

4. NUREG-0800, Section 15.4.9, Revision 2, July 1981.

5. 10 CFR 100.11.

6. NEDO-21778-A, "Transient Pressure Rises Affected Fracture Toughness Requirements for Boiling Water Reactors," December 1978.

7. ASME, Boiler and Pressure Vessel Code.

8. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

9. NEDO 33091-A, Revision 2, "Improved BPWS Control Rod Insertion Process," April 2003.

BASES

ACTIONS (continued)

D.1

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

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1, SR 3.1.7.2, and SR 3.1.7.3

SR 3.1.7.1 through SR 3.1.7.3 ~~are 24 hour Surveillances~~ verify~~ing~~ certain characteristics of the SLC System (e.g., the volume and temperature of the borated solution in the storage tank), thereby ensuring SLC System OPERABILITY without disturbing normal plant operation. These Surveillances ensure that the proper borated solution volume and temperature, including the temperature of the pump suction piping, are maintained. Maintaining a minimum specified borated solution temperature is important in ensuring that the sodium pentaborate remains in solution and does not precipitate out in the storage tank or in the pump suction piping. The temperature versus concentration curve of Figure 3.1.7-2 ensures that a 10°F margin will be maintained above the saturation temperature. An alternate method of performing SR 3.1.7.3 is to verify the OPERABILITY of the SLC heat trace system. This verifies the continuity of the heat trace lines and ensures proper heat trace operation, which ensure that the SLC suction piping temperature is maintained. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The 24 hour Frequency is based on operating experience and has shown there are relatively slow variations in the measured parameters of volume and temperature.~~

SR 3.1.7.4 and SR 3.1.7.6

SR 3.1.7.4 verifies the continuity of the explosive charges in the injection valves to ensure that proper operation will occur if required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The 31 day Frequency is based on~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.7.4 and SR 3.1.7.6 (continued)

~~operating experience and has demonstrated the reliability of the explosive charge continuity~~.

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

SR 3.1.7.5

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.7.7

Demonstrating that each SLC System pump develops a flow rate ≥ 40.0 gpm at a discharge pressure ≥ 1250 psig without actuating the pump's relief valve ensures that pump performance has not degraded during the fuel cycle. Testing at 1250 psig assures that the functional capability of the SLC system meets the ATWS Rule (10 CFR 50.62) (Ref. 1) requirements. This minimum pump flow rate requirement ensures that, when combined with the sodium pentaborate solution concentration requirements, the rate of negative reactivity insertion from the SLC System will adequately compensate for the positive reactivity effects encountered during power reduction, cooldown of the moderator, and xenon decay. Additionally, the minimum pump flow rate requirement ensures that adequate buffering agent will reach the suppression pool to maintain pH above 7.0. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this Surveillance is in accordance with the Inservice Testing Program.

SR 3.1.7.8 and SR 3.1.7.9

These Surveillances ensure that there is a functioning flow path from the boron solution storage tank to the RPV, including the firing of an explosive valve. The replacement charge for the explosive valve shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of that batch successfully fired. ~~The pump and explosive valve tested should be alternated such that both complete flow paths are tested every 48 months at alternating 24 month intervals.~~ The Surveillance may be performed in separate steps to prevent injecting solution into the RPV. An acceptable method for verifying flow from the pump to the RPV is to pump demineralized water from a test tank through one SLC subsystem and into the RPV. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Demonstrating that all heat traced piping between the boron solution storage tank and the suction inlet to the injection

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.7.8 and SR 3.1.7.9 (continued)

pumps is unblocked ensures that there is a functioning flow path for injecting the sodium pentaborate solution. An acceptable method for verifying that the suction piping is unblocked is to pump from the storage tank to the test tank. This test can be performed by any series of overlapping or total flow path test so that the entire flow path is included. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The 24 month Frequency is acceptable since there is a low probability that the subject piping will be blocked due to precipitation of the boron from solution in the heat traced piping.~~ This is especially true in light of the temperature verification of this piping required by SR 3.1.7.3. However, if, in performing SR 3.1.7.3, it is determined that the temperature of this piping has fallen below the specified minimum or the heat trace was not properly energized and building temperature was below the temperature at which the SLC solution would precipitate out, SR 3.1.7.9 must be performed once within 24 hours after the piping temperature is restored to within the limits of Figure 3.1.7-2.

SR 3.1.7.10

Enriched sodium pentaborate solution is made by mixing granular, enriched sodium pentaborate with water. Verification of the actual B-10 enrichment must be performed prior to addition to the SLC tank in order to ensure that the proper B-10 atom percentage is being used. This verification may be based on independent isotopic analysis or a manufacturer certificate of compliance.

REFERENCES

1. 10 CFR 50.62.

2. FSAR, Section 9.3.5.

3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

ACTIONS

C.1 (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

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

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

SR 3.1.8.2

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

SR 3.1.8.3

SR 3.1.8.3 is an integrated test of the SDV vent and drain valves to verify total system performance. After receipt of a simulated or actual scram signal, the closure of the SDV vent and drain valves is verified. The closure time of

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.3 (continued)

30 seconds after receipt of a scram signal is based on the bounding leakage case evaluated in the accident analysis based on the requirements of Reference 2. Similarly, after receipt of a simulated or actual scram reset signal, the opening of the SDV vent and drain valves is verified. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1 and the scram time testing of control rods in LCO 3.1.3 overlap this Surveillance to provide complete testing of the assumed safety function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The 24 month Frequency is based on the need to perform portions of this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. FSAR, Section 4.6.
2. 10 CFR 50.67
3. NUREG-0803, "Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping," August 1981.
4. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).
5. TSTF-404-A, Rev. 0.

ACTIONS (continued)

B.1

If the APLHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 23% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 23% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

APLHGRs are required to be initially calculated within 24 hours after THERMAL POWER is ≥ 23% RTP and ~~then every 24 hours~~periodically thereafter. Additionally, APLHGRs must be calculated prior to exceeding 44% RTP unless performed in the previous 24 hours. APLHGRs are compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. ~~The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation.~~ The 24 hour allowance after THERMAL POWER ≥ 23% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels and because the APLHGRs must be calculated prior to exceeding 44% RTP. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Not used.

2. Not used.

3. EMF-2361(P)(A), "EXEM BWR-2000 ECCS Evaluation Model," Framatome ANP.

4. ANF-CC-33(P)(A) Supplement 2, "HUXY: A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option," January 1991.

5. XN-CC-33(P)(A) Revision 1, "HUXY: A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option Users Manual," November 1975.

(continued)

BASES

APPLICABILITY (continued)

continue to the 5% to 15% power range when entry into MODE 2 occurs. When in MODE 2, the intermediate range monitor provides rapid scram initiation for any significant power increase transient, which effectively eliminates any MCPR compliance concern. Therefore, at THERMAL POWER levels < 23% RTP, the reactor is operating with substantial margin to the MCPR limits and this LCO is not required.

ACTIONS

A.1

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

B.1

If the MCPR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to < 23% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 23% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

The MCPR is required to be initially calculated within 24 hours after THERMAL POWER is ≥ 23% RTP and then ~~every 24 hours~~periodically thereafter. Additionally, MCPR must be calculated prior to exceeding 44% RTP unless performed in the previous 24 hours. MCPR is compared to the specified limits in the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1 (continued)

COLR to ensure that the reactor is operating within the assumptions of the safety analysis. ~~The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation.~~ The 24 hour allowance after THERMAL POWER ≥ 23% RTP is achieved is acceptable given the large inherent margin to operating limits at low power levels and because the MCPR must be calculated prior to exceeding 44% RTP. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.2.2.2

Because the transient analysis takes credit for conservatism in the scram time performance, it must be demonstrated that the specific scram time is consistent with those used in the transient analysis. SR 3.2.2.2 compares the average measured scram times to the assumed scram times documented in the COLR. The COLR contains a table of scram times based on the LCO 3.1.4 "Control Rod Scram Times" and the realistic scram times, both of which are used in the transient analysis. If the average measured scram times are greater than the realistic scram times then the MCPR operating limits corresponding to the Maximum Allowable Average Scram Insertion Time must be implemented. Determining MCPR operating limits based on interpolation between scram insertion times is not permitted. The average measured scram times and corresponding MCPR operating limit must be determined once within 72 hours after each set of scram time tests required by SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3 and SR 3.1.4.4 because the effective scram times may change during the cycle. The 72 hour Completion Time is acceptable due to the relatively minor changes in average measured scram times expected during the fuel cycle.

REFERENCES

1. NUREG-0562, June 1979.

2. XN-NF-80-19(P)(A) Volume 1 and Supplements 1 and 2, "Exxon Nuclear Methodology for Boiling Water Reactors," Exxon Nuclear Company, March 1983.

(continued)

BASES

ACTIONS

A.1 (continued)

restore the LHGR(s) to within its required limits such that the plant is operating within analyzed conditions. The 2 hour Completion Time is normally sufficient to restore the LHGR(s) to within its limits and is acceptable based on the low probability of a transient or Design Basis Accident occurring simultaneously with the LHGR out of specification.

B.1

If the LHGR cannot be restored to within its required limits within the associated Completion Time, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, THERMAL POWER is reduced to < 23% RTP within 4 hours. The allowed Completion Time is reasonable, based on operating experience, to reduce THERMAL POWER to < 23% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

The LHGR is required to be initially calculated within 24 hours after THERMAL POWER is ≥ 23% RTP and ~~then every 24 hours~~periodically thereafter. Additionally, LHGRs must be calculated prior to exceeding 44% RTP unless performed in the previous 24 hours. The LHGR is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. ~~The 24 hour Frequency is based on both engineering judgment and recognition of the slow changes in power distribution during normal operation.~~ The 24 hour allowance after THERMAL POWER ≥ 23% RTP is achieved is acceptable given the large inherent margin to operating limits at lower power levels and because the LHGRs must be calculated prior to exceeding 44% RTP. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 4.

2. FSAR, Section 5.

3. NUREG-0800, Section II.A.2(g), Revision 2, July 1981.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.1 and SR 3.3.1.1.2

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.1 and SR 3.3.1.1.2 (continued)

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The Frequency of once every 12 hours for SR 3.3.1.1.1 is based upon operating experience that demonstrates that channel failure is rare~~. ~~The Frequency of once every 24 hours for SR 3.3.1.1.2 is based upon operating experience that demonstrates that channel failure is rare and the evaluation in References 15 and 16.~~ The CHANNEL CHECK supplements less formal checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.3

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

A restriction to satisfying this SR when < 23% RTP is provided that requires the SR to be met only at ≥ 23% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 23% RTP. At low power levels, a high degree of accuracy is unnecessary because of the large, inherent margin to thermal limits (MCPR, LHGR and APLHGR). At ≥ 23% RTP, the Surveillance is required to have been satisfactorily performed ~~within the last 7 days,~~ in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 23% if the ~~7 day~~ Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 23% RTP. Twelve hours is based on operating experience and in

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.3 (continued)

consideration of providing a reasonable time in which to complete the SR. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

As noted, SR 3.3.1.1.4 is not required to be performed when entering MODE 2 from MODE 1, since testing of the MODE 2 required IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This allows entry into MODE 2 if the ~~7 day~~ Frequency is not met per SR 3.0.2. In this event, the SR must be

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.4 (continued)

performed within 12 hours after entering MODE 2 from MODE 1. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~A Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval and is based on reliability analysis (Ref. 9).~~

SR 3.3.1.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. ~~A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on the reliability analysis of Reference 9.~~ (The Manual Scram Function's CHANNEL FUNCTIONAL TEST Frequency was credited in the analysis to extend many automatic scram Functions' Frequencies.) The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.1.6 and SR 3.3.1.1.7

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

The overlap between SRMs and IRMs is required to be demonstrated to ensure that reactor power will not be increased into a neutron flux region without adequate indication. The overlap is demonstrated prior to fully withdrawing the SRMs from the core. Demonstrating the overlap prior to fully withdrawing the SRMs from the core is required to ensure the SRMs are on-scale for the overlap demonstration.

The overlap between IRMs and APRMs is of concern when reducing power into the IRM range. On power increases, the system design will prevent further increases (by initiating a rod block) if adequate overlap is not maintained. Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between MODE 1 and MODE 2 can be made without either APRM downscale rod block, or IRM upscale rod block. Overlap

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.6 and SR 3.3.1.1.7 (continued)

between SRMs and IRMs similarly exists when, prior to fully withdrawing the SRMs from the core, IRMs are above mid-scale on range 1 before SRMs have reached the upscale rod block.

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

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.~~

SR 3.3.1.1.8

LPRM gain settings are determined from the local flux profiles that are either measured by the Traversing Incore Probe (TIP) System at all functional locations or calculated for TIP locations that are not functional. The methodology used to develop the power distribution limits considers the uncertainty for both measured and calculated local flux profiles. This methodology assumes that all the TIP locations are functional for the first LPRM calibration following a refueling outage, and a minimum of 25 functional TIP locations for subsequent LPRM calibrations. The calibrated LPRMs establish the relative local flux profile for appropriate representative input to the APRM System. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The 1000 MWD/MT Frequency is based on operating experience with LPRM sensitivity changes.~~

SR 3.3.1.1.9 and SR 3.3.1.1.14

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the

(continued)

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SR 3.3.1.1.9 and SR 3.3.1.1.14 (continued)

intended function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 92 day Frequency of SR 3.3.1.1.9 is based on the reliability analysis of Reference 9.~~

SR 3.3.1.1.9 is modified by a Note that provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relay which input into the combinational logic. (Reference 10) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.1.1.15. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 24 month Frequency of SR 3.3.1.1.14 is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency.~~

SR 3.3.1.1.10, SR 3.3.1.1.11, SR 3.3.1.1.13, and SR 3.3.1.1.18

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

Note 1 for SR 3.3.1.1.18 states that neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the ~~7 day~~ calorimetric calibration (SR 3.3.1.1.3) and the ~~2000 MWD/MT~~ LPRM

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.10, SR 3.3.1.1.11, SR 3.3.1.1.13 and SR 3.3.1.1.18 (continued)

calibration against the TIPs (SR 3.3.1.1.8).

A Note is provided for SR 3.3.1.1.11 that requires the IRM SRs to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM and IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

A second note is provided for SR 3.3.1.1.18 that requires that the recirculation flow (drive flow) transmitters, which supply the flow signal to the APRMs, be included in the SR for Functions 2.b and 2.f. The APRM Simulated Thermal Power-High Function (Function 2.b) and the OPRM Trip Function (Function 2.f) both require a valid drive flow signal. The APRM Simulated Thermal Power-High Function uses drive flow to vary the trip setpoint. The OPRM Trip Function uses drive flow to automatically enable or bypass the OPRM Trip output to the RPS. A CHANNEL CALIBRATION of the APRM drive flow signal requires both calibrating the drive flow transmitters and the processing hardware in the APRM equipment. SR 3.3.1.1.20 establishes a valid drive flow / core flow relationship. Changes throughout the cycle in the drive flow / core flow relationship due to the changing thermal hydraulic operating conditions of the core are accounted for in the margins included in the bases or analyses used to establish the setpoints for the APRM Simulated Thermal Power-High Function and the OPRM Trip Function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 184 days for SR 3.3.1.1.11, 92 days for SR 3.3.1.1.12 and 24 months for SR 3.3.1.1.13 and SR 3.3.1.1.18 is based upon the assumptions in the determination of the magnitude of equipment drift in the setpoint analysis.~~

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SR 3.3.1.1.12

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. For the APRM Functions, this test supplements the automatic self-test functions that operate continuously in the APRM and voter channels. The scope of the APRM CHANNEL FUNCTIONAL TEST is that which is necessary to test the hardware. Software controlled functions are tested as part of the initial verification and validation and are only incidentally tested as part of the surveillance testing. Automatic self-test functions check the EPROMs in which the software-controlled logic is defined. Changes in the EPROMs will be detected by the self-test function and alarmed via the APRM trouble alarm. SR 3.3.1.1.1 for the APRM functions includes a step to confirm that the automatic self-test function is still operating.

The APRM CHANNEL FUNCTIONAL TEST covers the APRM channels (including recirculation flow processing -- applicable to Function 2.b and the auto-enable portion of Function 2.f only), the 2-out-of-4 Voter channels, and the interface connections into the RPS trip systems from the voter channels.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 184-day Frequency of SR 3.3.1.1.12 is based on the reliability analyses of References 15 and 16~~. (NOTE: The actual voting logic of the 2-out-of-4 Voter Function is tested as part of SR 3.3.1.1.15. The auto-enable setpoints for the OPRM Trip are confirmed by SR 3.3.1.1.19.)

A Note is provided for Function 2.a that requires this SR to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM Function cannot be performed in MODE 1 without utilizing jumpers or lifted leads. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2.

A second Note is provided for Functions 2.b and 2.f that clarifies that the CHANNEL FUNCTIONAL TEST for Functions 2.b and 2.f includes testing of the recirculation flow processing electronics, excluding the flow transmitters.

SR 3.3.1.1.15

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods (LCO 3.1.3), and SDV vent

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SR 3.3.1.1.15 (continued)

and drain valves (LCO 3.1.8), overlaps this Surveillance to provide complete testing of the assumed safety function.

The LOGIC SYSTEM FUNCTIONAL TEST for APRM Function 2.e simulates APRM and OPRM trip conditions at the 2-out-of-4 Voter channel inputs to check all combinations of two tripped inputs to the 2-out-of-4 logic in the voter channels and APRM-related redundant RPS relays.

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

SR 3.3.1.1.16

This SR ensures that scrams initiated from the Turbine Stop Valve—Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 26% RTP. This is performed by a Functional check that ensures the scram feature is not bypassed at ≥ 26% RTP. Because main turbine bypass flow can affect this function nonconservatively (THERMAL POWER is derived from turbine first stage pressure), the opening of the main turbine bypass valves must not cause the trip Function to be bypassed when Thermal Power is ≥ 26% RTP.

If any bypass channel's trip function is nonconservative (i.e., the Functions are bypassed at ≥ 26% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve—Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel is considered OPERABLE.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 24 months is based on engineering judgment and reliability of the components.~~

SR 3.3.1.1.17

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. This test may be performed in one

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.17 (continued)

measurement or in overlapping segments, with verification that all components are tested. The RPS RESPONSE TIME acceptance criteria are included in Reference 11.

RPS RESPONSE TIME for the APRM 2-out-of-4 Voter Function (2.e) includes the APRM Flux Trip output relays and the OPRM Trip output relays of the voter and the associated RPS relays and contactors. (Note: The digital portion of the APRM, OPRM and 2-out-of-4 Voter channels are excluded from RPS RESPONSE TIME testing because self-testing and calibration checks the time base of the digital electronics. Confirmation of the time base is adequate to assure required response times are met. Neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time. See References 12 and 13).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~RPS RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. Note 3 requires STAGGERED TEST BASIS Frequency to be determined based on 4 channels per trip system, in lieu of the 8 channels specified in Table 3.3.1.1-1 for the MSIV Closure Function because channels are arranged in pairs.~~

~~This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal. The 24 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~

SR 3.3.1.1.17 for Function 2.e confirms the response time of that function, and also confirms the response time of components to Function 2.e and other RPS functions. (Reference 14)

~~Note 3 allows the STAGGERED TEST BASIS Frequency for Function 2.e to be determined based on 8 channels rather than the 4 actual 2-out-of-4 Voter channels.~~ The redundant outputs from the 2-out-of-4 Voter channel (2 for APRM trips and 2 for OPRM trips) are considered part of the same channel, but the OPRM and APRM outputs are considered to be separate channels for application of SR 3.3.1.1.17~~, so N = 8~~. The note further requires that testing of OPRM and APRM outputs from a 2-out-of-4 Voter be alternated. In addition to these commitments, References 15 and 16 require that the testing of inputs to each RPS Trip System alternate.

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SR 3.3.1.1.19

This surveillance involves confirming the OPRM Trip auto-enable setpoints. The auto-enable setpoint values are considered to be nominal values as discussed in Reference 21. This surveillance ensures that the OPRM Trip is enabled (not bypassed) for the correct values of APRM Simulated Thermal Power and recirculation drive flow. Other surveillances ensure that the APRM Simulated Thermal Power and recirculation drive flow properly correlate with THERMAL POWER (SR 3.3.1.1.2) and core flow (SR 3.3.1.1.20), respectively.

If any auto-enable setpoint is nonconservative (i.e., the OPRM Trip is bypassed when APRM Simulated Thermal Power ≥ 25% and recirculation drive flow ≤ value equivalent to the core flow value defined in the COLR, then the affected channel is considered inoperable for the OPRM Trip Function. Alternatively, the OPRM Trip auto-enable setpoint(s) may be adjusted to place the channel in a conservative condition (not bypassed). If the OPRM Trip is placed in the not-bypassed condition, this SR is met, and the channel is considered OPERABLE.

For purposes of this surveillance, consistent with Reference 21, the conversion from core flow values defined in the COLR to drive flow values used for this SR can be conservatively determined by a linear scaling assuming that 100% drive flow corresponds to 100 Mlb/hr core flow, with no adjustment made for expected deviations between core flow and drive flow below 100%.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program ~~The Frequency of 24 months is based on engineering judgment considering the reliability of the components.~~

SR 3.3.1.1.20

The APRM Simulated Thermal Power-High Function (Function 2.b) uses drive flow to vary the trip setpoint. The OPRM Trip Function (Function 2.f) uses drive flow to automatically enable or bypass the OPRM Trip output to RPS. Both of these Functions use drive flow as a representation of reactor core flow. SR 3.3.1.1.18 ensures that the drive flow transmitters and processing electronics are calibrated. This SR adjusts the recirculation drive flow scaling factors in each APRM channel to provide the appropriate drive flow/core flow alignment.

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SR 3.3.1.1.20

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The Frequency of 24 months considers that any change in the core flow to drive flow functional relationship during power operation would be gradual and the maintenance of the Recirculation System and core components that may impact the relationship is expected to be performed during refueling outages. This frequency also considers the period after reaching plant equilibrium conditions necessary to perform the test, engineering judgment of the time required to collect and analyze the necessary flow data, and engineering judgment of the time required to enter and check the applicable scaling factors in each of the APRM channels. This timeframe is acceptable based on the relatively small alignment errors expected, and the margins already included in the APRM Simulated Thermal Power – High and OPRM Trip Function trip – enable setpoints.~~

REFERENCES

1. FSAR, Figure 7.2-1.
2. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).
3. NEDO-23842, "Continuous Control Rod Withdrawal in the Startup Range," April 18, 1978.
4. FSAR, Section 5.2.2.
5. FSAR, Chapter 15.
6. FSAR, Section 6.3.3.

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.1 and SR 3.3.1.2.3 (continued)

is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

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

SR 3.3.1.2.2

To provide adequate coverage of potential reactivity changes in the core, a maximum of two SRMs are required to be OPERABLE. One SRM is required to be OPERABLE in the quadrant where CORE ALTERATIONS are being performed, and the other OPERABLE SRM must be in an adjacent quadrant containing fuel. However, in accordance with Table 3.3.1.2-1, only one SRM is required during a spiral reload until the fueled region is large enough to encompass a second installed SRM. Note 1 states that the SR is required to be met only during CORE ALTERATIONS. It is not required to be met at other times in MODE 5 since core reactivity changes are not occurring. This Surveillance consists of a review of plant logs to ensure that SRMs required to be OPERABLE for given CORE ALTERATIONS are, in fact, OPERABLE. In the event that only one SRM is required to be OPERABLE, per Table 3.3.1.2-1, footnote (b), only the a. portion of this SR is required. Note 2 clarifies that more than one of the three requirements can be met by the same OPERABLE SRM. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities~~

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.2 (continued)

~~that include steps to ensure that the SRMs required by the LCO are in the proper quadrant.~~

SR 3.3.1.2.4

This Surveillance consists of a verification of the SRM instrument readout to ensure that the SRM reading is greater than a specified minimum count rate, ~~which ensures that the detectors are indicating count rates indicative~~ of neutron flux levels within the core. The signal-to-noise ratio shown in Figure 3.3.1.2-1 is the SRM count rate at which there is a 95% probability that the SRM signal indicates the presence of neutrons and only a 5% probability that the SRM signal is a result of noise (Ref. 1). With few fuel assemblies loaded, the SRMs will not have a high enough count rate to satisfy the SR. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the minimum count rate.

To accomplish this, the SR is modified by a Note that states that the count rate is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated core quadrant, even with a control rod withdrawn, the configuration will not be critical. ~~The signal to noise ratio is only required to be determined every 7 or 31 days per the requirements of SR 3.3.1.2.5 or 3.3.1.2.6.~~

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

SR 3.3.1.2.5 and SR 3.3.1.2.6

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated channel will function properly. SR 3.3.1.2.5 is

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.5 and SR 3.3.1.2.6 (continued)

required in MODE 5, and ~~the 7 day Frequency~~ ensures that the channels are OPERABLE while core reactivity changes could be in progress. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~This Frequency is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK), that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.~~

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

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

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

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SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.7

Performance of a CHANNEL CALIBRATION ~~at a Frequency of 24 months~~ verifies the performance of the SRM detectors and associated circuitry. The Frequency considers the plant conditions required to perform the test, the ease of performing the test, and the likelihood of a change in the system or component status. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The neutron detectors are excluded from the CHANNEL CALIBRATION because they cannot readily be adjusted. The detectors are fission chambers that are designed to have a relatively constant sensitivity over the range and with an accuracy specified for a fixed useful life.

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the ~~24 month~~ Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

REFERENCES

1. General Electric Service Information Letter (SIL) 478 "SRM Minimum Count Rate" dated December 16, 1988.

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SURVEILLANCE REQUIREMENTS (continued)

assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a control rod block will be initiated when necessary.

SR 3.3.2.1.1

A CHANNEL FUNCTIONAL TEST is performed for each RBM channel to ensure that the entire channel will perform the intended function. It includes the Reactor Manual Control Multiplexing System input. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 184 days is based on reliability analyses (Refs. 8, 12 and 13).~~

SR 3.3.2.1.2 and SR 3.3.2.1.3

A CHANNEL FUNCTIONAL TEST is performed for the RWM to ensure that the entire system will perform the intended function. The CHANNEL FUNCTIONAL TEST for the RWM is performed by attempting to withdraw a control rod not in compliance with the prescribed sequence and verifying a control rod block occurs and by verifying proper indication of the selection error of at least one out-of-sequence control rod. As noted in the SRs, SR 3.3.2.1.2 is not required to be performed until 1 hour after any control rod is withdrawn in MODE 2. As noted, SR 3.3.2.1.3 is not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. This allows entry into MODE 2 for SR 3.3.2.1.2, and entry into MODE 1 when THERMAL POWER is ≤ 10% RTP for SR 3.3.2.1.3, to perform the required Surveillance if the ~~92 day~~ Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequencies are based on reliability analysis (Ref. 8).~~

SR 3.3.2.1.4

The RBM setpoints are automatically varied as a function of Simulated Thermal Power. Three control rod block Allowable Values are specified in Table 3.3.2.1-1, each within a specific power range. The power at which the control rod block Allowable Values automatically change are based on the APRM signal's input to each RBM channel. Below the minimum power setpoint, the RBM is automatically bypassed. These control rod block NTSPs must be verified periodically to be less than or equal to the specified Allowable Values. If any power range setpoint is non-conservative, then the affected RBM channel is considered inoperable. As noted, neutron detectors are excluded from the Surveillance because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.3 and SR 3.3.1.1.8. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 24 month Frequency is based on the actual trip setpoint methodology utilized for these channels.~~

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SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.5

The RWM is automatically bypassed when power is above a specified value. The power level is determined from steam flow signals. The automatic bypass setpoint must be verified periodically to be not bypassed ≤ 10% RTP. This is performed by a Functional check. If the RWM low power setpoint is nonconservative, then the RWM is considered inoperable. Alternately, the low power setpoint channel can be placed in the conservative condition (nonbypass). If placed in the nonbypassed condition, the SR is met and the RWM is not considered inoperable. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based on the need to perform the Surveillance during a plant start-up~~.

SR 3.3.2.1.6

A CHANNEL FUNCTIONAL TEST is performed for the Reactor Mode Switch—Shutdown Position Function to ensure that the entire channel will perform the intended function. The CHANNEL FUNCTIONAL TEST for the Reactor Mode Switch—Shutdown Position Function is performed by attempting to withdraw any control rod with the reactor mode switch in the shutdown position and verifying a control rod block occurs.

As noted in the SR, the Surveillance is not required to be performed until 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable

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SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.6 (continued)

links. This allows entry into MODES 3 and 4 if the ~~24 month~~ Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

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

SR 3.3.2.1.7

CHANNEL CALIBRATION is a test that verifies the channel responds to the measured parameter with the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibration consistent with the plant specific setpoint methodology.

As noted, neutron detectors are excluded from the CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.8.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.2.1.7 for the RBM Functions is modified by two Notes as identified in Table 3.3.2.1-1. The RBM Functions are Functions that are LSSSs for reactor core Safety Limits. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is not the NTSP but is conservative with respect to the Allowable Value. For digital channel components, no as-found tolerance or as-left tolerance can be specified. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program.

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SURVEILLANCE REQUIREMENTS (continued)

or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 2) assumption that 6 hours is the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the feedwater pump turbines and main turbine will trip when necessary.

SR 3.3.2.2.1

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

Agreement criteria, which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency 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 checks of channel status during normal operational use of the displays associated with the channels required by the LCO.~~

SR 3.3.2.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.2.2 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on reliability analysis (Ref. 2).~~

This SR is modified by two Notes. Note 1 provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design architecture of the ICS (e.g. digital control blocks and logic) does not facilitate complete functional testing of all required logic blocks, which input into the combinational logic. (Reference 4) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the "logical blocks" which input into the combinational logic. The required "logical blocks" not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.2.2.4. This is acceptable because operating experience shows that the "logical blocks" not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

Note 2 provides a second specific exception to the definition of CHANNEL FUNCTIONAL TEST. For the Feedwater - Main Turbine High Water Level Trip Function, certain required channel "logical blocks" are not included in the performance of the CHANNEL FUNCTIONAL TEST. These exceptions are necessary because the circuit design does not facilitate functional testing of the entire channel through to the combinational logic. (Reference 4) Specifically, testing of all required "logical blocks" could lead to unplanned transients. Therefore, for this circuit, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the actuation of circuit devices up to the point where further testing could result in an unplanned transient. (References 5 and 6) The required "logical blocks" not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.2.2.4. This exception is acceptable because operating experience shows that the devices not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.2.3

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon the assumption of an 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.2.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the feedwater - main turbine valves is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a valve is incapable of operating, the associated instrumentation would also be inoperable. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency.~~

REFERENCES

1. FSAR, Section 15.1.2.

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

3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

(continued)

BASES

ACTIONS

E.1 (continued)

from full power conditions in an orderly manner and without challenging plant systems.

F.1

Since alternate means of monitoring primary containment area radiation have been developed and tested, the Required Action is not to shut down the plant, but rather to follow the directions of Specification 5.6.7. These alternate means will be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

SURVEILLANCE REQUIREMENTS

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

SR 3.3.3.1.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1.1 (continued)

parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit and does necessarily indicate the channel is Inoperable.

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

SR 3.3.3.1.2 and SR 3.3.3.1.3

~~A CHANNEL CALIBRATION is performed every 92 days for the containment Hydrogen and Oxygen Analyzers or 24 months for the other Functions except for the PCIV Position Function.~~ The PCIV Position Function is adequately demonstrated by the Remote Position Indication performed in accordance with 5.5.6, "Inservice Testing Program". CHANNEL CALIBRATION verifies that the channel responds to measured parameter with the necessary range and accuracy, and does not include alarms.

The CHANNEL CALIBRATION for the Containment High Radiation instruments shall consist of an electronic calibration of the channel, not including the detector, 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.

~~The CHANNEL CALIBRATION for the hydrogen analyzers, use a sample gas containing: a) Nominal zero volume percent hydrogen, balance nitrogen and b) Nominal thirty volume percent hydrogen, balance nitrogen.~~ The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based on operating experience and for the 24 month Frequency consistency with the industry refueling cycles.~~

~~The Frequency is based on operating experience and for the 24 month Frequency consistency with the industry refueling cycles.~~

(continued)

BASES

ACTIONS (continued)

B.1

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

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each Remote Shutdown System Instrument Function are located in the SRs column of Table 3.3.3.2-1.

SR 3.3.3.2.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include 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, and does not necessary indicate the channel is Inoperable. As specified in the Surveillance, a CHANNEL CHECK is only required for those channels that are normally energized.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon plant operating experience that demonstrates channel failure is rare.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.2.2

SR 3.3.3.2.2 verifies each required Remote Shutdown System transfer switch and control circuit performs the intended function. This verification is performed from the remote shutdown panel. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the plant can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~Operating experience demonstrates that Remote Shutdown System control channels usually pass the Surveillance when performed at the 24 month Frequency~~.

SR 3.3.3.2.3

CHANNEL CALIBRATION verifies that the channel responds to measured parameter values with the necessary range and accuracy.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 24 month Frequency is based upon operating experience and consistency with the typical industry refueling cycle.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 19.
2. FSAR 7.4.1.4.
3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 32193)

BASES

SURVEILLANCE REQUIREMENTS (continued)

time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the recirculation pumps will trip when necessary.

SR 3.3.4.1.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

This SR is modified by a Note that provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relay which input into the combinational logic. (Reference 7) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.4.1.3. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on reliability analysis of Reference 5.~~

SR 3.3.4.1.2

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1.2 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon the assumption of an 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.4.1.3

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

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

~~Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency.~~

SR 3.3.4.1.4

This SR ensures that an EOC-RPT initiated from the TSV—Closure and TCV Fast Closure, Trip Oil Pressure—Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 26% RTP. This is performed by a Functional check that ensures the EOC-RPT Function is not bypassed. Because increasing the main turbine bypass flow can affect this function nonconservatively (THERMAL POWER is derived from first stage pressure) the main turbine bypass valves must not cause the trip Functions to be bypassed when thermal power is ≥ 26% RTP. If any functions are bypassed at ≥ 26% RTP, either due to open main turbine bypass valves or other reasons, the affected TSV—Closure and TCV Fast Closure, Trip Oil Pressure—Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met with the channel considered OPERABLE.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1.4 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 24 months has shown that channel bypass failures between successive tests are rare.~~

SR 3.3.4.1.5

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The EOC-RPT SYSTEM RESPONSE TIME acceptance criteria are included in Reference 5.

A Note to the Surveillance states that breaker interruption time may be assumed from the most recent performance of SR 3.3.4.1.6. This is allowed since the time to open the contacts after energization of the trip coil and the arc suppression time are short and do not appreciably change, due to the design of the breaker opening device and the fact that the breaker is not routinely cycled.

~~EOC-RPT SYSTEM RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. For this SR, STAGGERED TEST BASIS means that each 24 month test shall include at least the logic of one type of channel input, turbine control valve fast closure or turbine stop valve closure such that both types of channel inputs are tested at least one per 48 months.~~ Response times cannot be determined at power because operation of final actuated devices is required. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~Therefore, the 24 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components that cause serious response time degradation, but not channel failure, are infrequent occurrences.~~

SR 3.3.4.1.6

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

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

SR 3.3.4.2.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is inoperable.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

This SR is modified by a Note that provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relay which input into the combinational logic. (Reference 4) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.4.2.5. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on the reliability analysis of Reference 2.~~

SR 3.3.4.2.3 and SR 3.3.4.2.4

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The calibrated Frequency is based upon the assumption used for the calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump RPT breakers is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) (two channels of Reactor Vessel Water Level--Low Low, Level 2 and two channels of Reactor Steam Dome Pressure--High) would be inoperable.

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

REFERENCES

1. GENE-637, 024, -0893, Evaluation of SSES ATWS Performance for Power Uprate Conditions, Sept 1993.

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

3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 32193).

4. NRC Inspection and Enforcement Manual, Part 9900: Technical Guidance, Standard Technical Specification Section 1.0 Definitions, Issue date 12/08/86.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon operating experience that demonstrates channel failure is rare.~~ The CHANNEL CHECK supplements less formal checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.5.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on the reliability analyses of Reference 3~~.

This SR is modified by a Note that provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relay which input into the combinational logic. (Reference 5) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.2 (continued)

change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.5.1.5. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

SR 3.3.5.1.3 and SR 3.3.5.1.4

A CHANNEL CALIBRATION is a complete check that verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.
The Surveillance Frequency is controlled under the Surveillance Frequency Control Program
~~The Frequency of SR 3.3.5.1.3 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

~~The Frequency of SR 3.3.5.1.4 is based upon the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.5.1.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.1, LCO 3.5.2, LCO 3.8.1, and LCO 3.8.2 overlaps this Surveillance to complete testing of the assumed safety function. The LOGIC SYSTEM FUNCTIONAL TEST tests the operation of the initiation logic up to but not including the first contact which is unique to an individually supported feature such as the starting of a DG.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.5 (continued)

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

REFERENCES

1. FSAR, Section 6.3.
2. FSAR, Chapter 15.
3. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988.
4. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 32193).
5. NRC Inspection and Enforcement Manual, Part 9900: Technical Guidance, Standard Technical Specification Section 1.0 Definitions, Issue date 12/08/86.

BASES

ACTIONS

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

to the suppression pool, which also performs the intended function. If it is not desired to perform Required Actions D.2.1 and D.2.2, Condition E must be entered and its Required Action taken.

E.1

With any Required Action and associated Completion Time not met, the RCIC System may be incapable of performing the intended function, and the RCIC System must be declared inoperable immediately

SURVEILLANCE REQUIREMENTS

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

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

SR 3.3.5.2.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a parameter on other similar

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2.1 (continued)

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon operating experience that demonstrates channel failure is rare.~~ The CHANNEL CHECK supplements less formal checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.5.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on the reliability analysis of Reference 1.~~

This SR is modified by a Note that provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relay which input into the combinational logic. (Reference 3) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2.2 (continued)

the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.5.2.5. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

SR 3.3.5.2.3 and SR 3.3.5.2.4

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of SR 3.3.5.2.3 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

~~The Frequency of SR 3.3.5.2.4 of 24 months is based upon the historical drift of the equipment and the assumption in the setpoint analysis.~~

SR 3.3.5.2.5

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2.5 (continued)

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

REFERENCES

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

2. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 32193).

3. NRC Inspection and Enforcement Manual, Part 9900: Technical Guidance, Standard Technical Specification Section 1.0 Definitions, Issue date 12/08/86.

BASES

SURVEILLANCE REQUIREMENTS

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

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

SR 3.3.6.1.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency 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 checks of channels during normal operational use of the displays associated with the channels required by the LCO.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 92 day Frequency of SR 3.3.6.1.2 is based on the reliability analysis described in References 5 and 6.~~

This SR is modified by two Notes. Note 1 provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relays which input into the combinational logic. (Reference 11) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.6.1.5. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

Note 2 provides a second specific exception to the definition of CHANNEL FUNCTIONAL TEST. For Functions 2.e, 3.a, and 4.a, certain channel relays are not included in the performance of the CHANNEL FUNCTIONAL TEST. These exceptions are necessary because the circuit design does not facilitate functional testing of the entire channel through to the coil of the relay which enters the combinational logic. (Reference 11) Specifically, testing of all required relays would require rendering the affected system (i.e., HPCI or RCIC) inoperable, or require lifting of leads and inserting test equipment which could lead to unplanned transients. Therefore, for these circuits, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the actuation of circuit devices up to the point where further testing could result in an unplanned transient. (References 10 and 12) The required relays not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.6.1.5. This exception

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.2 (continued)

is acceptable because operating experience shows that the devices not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

SR 3.3.6.1.3 and SR 3.3.6.1.4

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of SR 3.3.6.1.3 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.6.1.4 is based on the assumption of an 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

~~It should be noted that some of the primary containment High Drywell pressure instruments, although only required to be calibrated on a 24 month Frequency, are calibrated quarterly based on other TS requirements.~~

SR 3.3.6.1.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on PCIVs in LCO 3.6.1.3 overlaps this Surveillance to provide complete testing of the assumed safety function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 24 month Frequency is based on the need to perform portions of this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the guidance given in Reference 9 could not be met, which identified that degradation of response time can usually be detected by other surveillance tests.

As stated in Note 1, the response time of the sensors for Functions 1.b, is excluded from ISOLATION SYSTEM RESPONSE TIME testing. Because the vendor does not provide a design instrument response time, a penalty value to account for the sensor response time is included in determining total channel response time. The penalty value is based on the historical performance of the sensor. (Reference 13) This allowance is supported by Reference 9 which determined that significant degradation of the sensor channel response time can be detected during performance of other Technical Specification SRs and that the sensor response time is a small part of the overall ISOLATION RESPONSE TIME testing.

Function 1.a and 1.c channel sensors and logic components are excluded from response time testing in accordance with the provisions of References 14 and 15.

As stated in Note 2, response time testing of isolating relays is not required for Function 5.a. This allowance is supported by Reference 9. These relays isolate their respective isolation valve after a nominal 45 second time delay in the circuitry. No penalty value is included in the response time calculation of this function. This is due to the historical response time testing results of relays of the same manufacturer and model number being less than 100 milliseconds, which is well within the expected accuracy of the 45 second time delay relay.

ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7. This test may be performed in one measurement, or in overlapping segments, with verification that all components are tested.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. The 24 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.6 (continued)

~~components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~

REFERENCES

1. FSAR, Section 6.3.
2. FSAR, Chapter 15.
3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.
4. FSAR, Section 4.2.3.4.3.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.
7. FSAR, Table 7.3-29.
8. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).
9. NEDO-32291-A "System Analyses for Elimination of Selected Response Time Testing Requirements," October 1995.
10. PPL Letter to NRC, PLA-2618, Response to NRC INSPECTION REPORTS 50-387/85-28 AND 50-388/85-23, dated April 22, 1986.
11. NRC Inspection and Enforcement Manual, Part 9900: Technical Guidance, Standard Technical Specification Section 1.0 Definitions, Issue date 12/08/86.
12. Susquehanna Steam Electric Station NRC REGION I COMBINED INSPECTION 50-387/90-20; 50-388/90-20, File R41-2, dated March 5, 1986.
13. NRC Safety Evaluation Report related to Amendment No. 171 for License No. NPF-14 and Amendment No. 144 for License No. NPF-22.
14. NEDO 32291-A, Supplement 1, "System Analyses for the Elimination of Selected Response Time Testing Requirements," October 1999.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.6.2.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency 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 checks of channel status during normal operational use of the displays associated with channels required by the LCO.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

This SR is modified by a Note that provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relay which input into the combinational logic. (Reference 8) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.6.2.5. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on the reliability analysis of References 5 and 6.~~

SR 3.3.6.2.3 and SR 3.3.6.2.4

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequencies of SR 3.3.6.2.3 and SR 3.3.6.2.4 are based on the assumption of a 92 day and an 24 month calibration interval, respectively, in the determination of the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.5

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

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

~~Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency.~~

REFERENCES

1. FSAR, Section 6.3.
2. FSAR, Chapter 15
3. FSAR, Section 15.2.
4. FSAR, Sections 15.7.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.
7. Final Policy Statement on Technical Specifications Improvements, July 22, 1993. (58 FR 32193)
8. NRC Inspection and Enforcement Manual, Part 9900: Technical Guidance, Standard Technical Specification Section 1.0 Definitions, Issue date 12/08/86.

BASES

ACTIONS (continued)

D.1

With any Required Action and associated Completion Time not met, the associated CREOAS subsystem must be declared inoperable immediately per Required Action D.1 to ensure that control room personnel will be protected in the event of a Design Basis Accident.

SURVEILLANCE REQUIREMENTS

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

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

SR 3.3.7.1.1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1.1 (continued)

Agreement criteria, which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon operating experience that demonstrates channel failure is rare.~~ The CHANNEL CHECK supplements less formal checks of channel status during normal operational use of the displays associated with channels required by the LCO.

SR 3.3.7.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency of 92 days is based on the reliability analyses of References 3 and 4.~~

This SR is modified by two Notes. Note 1 provides a general exception to the definition of CHANNEL FUNCTIONAL TEST. This exception is necessary because the design of instrumentation does not facilitate functional testing of all required contacts of the relays which input into the combinational logic. (Reference 6) Performance of such a test could result in a plant transient or place the plant in an undo risk situation. Therefore, for this SR, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of the relay which inputs into the combinational logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.7.1.5. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.2

Note 2 provides a second specific exception to the definition of CHANNEL FUNCTIONAL TEST. For Function 8, certain channel relays are not included in the performance of the CHANNEL FUNCTIONAL TEST. These exceptions are necessary because the circuit design does not facilitate functional testing of the entire channel through to the coil of the relay, which enters the combinational logic. (Reference 6) Specifically, testing of all required relays would require lifting of leads and inserting test equipment, which could lead to unplanned transients. Therefore, for these circuits, the CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the actuation of circuit devices up to the point where further testing would result in an unplanned transient. (References 7 and 8) The required relays not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST, SR 3.3.7.1.5. This is acceptable because operating experience shows that the devices not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST, and the testing methodology minimizes the risk of unplanned transients.

SR 3.3.7.1.3 and SR 3.3.7.1.4

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequencies of SR 3.3.7.1.3 and SR 3.3.7.1.4 are based upon the assumption of a 92 day and a 24 month calibration interval respectively, in the determination of the magnitude of equipment drift in the setpoint analysis.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.7.3, "Control Room Emergency Outside Air Supply (CREOAS) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

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

REFERENCES

1. FSAR, Section 6.4.1.
2. FSAR, Table 15.2.
3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.
4. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
5. Final Policy Statement on Technical Specification Improvements, July 22, 1993 (58 FR 32193).
6. NRC Inspection and Enforcement Manual, Part 9900: Technical Guidance, Standard Technical Specification Section 1.0 Definitions, Issue date 12/08/86.
7. PPL Letter to NRC, PLA-2618, Response to NRC INSPECTION REPORTS 50-387/85-28 and 50-388/85-23, dated April 22, 1986.
8. Susquehanna Steam Electric Station NRC REGION I COMBINED INSPECTION 50-387/90-20; 50-388/90-20, File R41-2, dated March 5, 1986.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1.1

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

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties, may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon operating experience that demonstrates channel failure is rare.~~ The CHANNEL CHECK supplements less formal checks of channels during normal operational use of the displays associated with channels required by the LCO.

SR 3.3.8.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

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

SR 3.3.8.1.3

A CHANNEL CALIBRATION verifies that the channel responds to the measured parameter within the necessary range and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1.3 (continued)

accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based upon the assumption of an 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.8.1.4

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

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

REFERENCES

1. FSAR, Section 6.3.
2. FSAR, Chapter 15.
3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 32193)

BASES

ACTIONS

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

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

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.1

A CHANNEL FUNCTIONAL TEST is performed on each overvoltage, undervoltage, and underfrequency system to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

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

The ~~184 day Frequency and the~~ Note in the Surveillance is ~~are~~ based on guidance provided in Generic Letter 91-09 (Ref. 2).
The 184 day Frequency is based on Reference 2. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program

SR 3.3.8.2.2

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.2 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The Frequency is based on the assumption of an 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis~~.

SR 3.3.8.2.3

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

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

REFERENCES

1. FSAR, Section 8.3.1.6.
2. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electrical Protective Assemblies in Power Supplies for the Reactor Protection System
3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 32193)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1 (continued)

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

SR 3.4.1.2

As noted, this SR is only applicable when in single loop operation. This SR ensures the recirculation pump limit is maintained. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~The 24 hour Frequency is based on operating experience and the operators inherent knowledge of the current reactor status~~.

REFERENCES

1. FSAR, Section 6.3.3.7.
2. FSAR, Section 5.4.1.4.
3. GE NEDO-31960-A "BWROG Long Term Stability Solutions Licensing Methodology," November 1995.
4. GE NEDO-31960-A "BWROG Long Term Stability Solutions Licensing Methodology, Supplement 1," November 1995.
5. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1 (continued)

drive flow versus pump speed) are determined by the flow resistance from the loop suction through the jet pump nozzles. A change in the relationship indicates a plug, flow restriction, loss in pump hydraulic performance, leakage, or new flow path between the recirculation pump discharge and jet pump nozzle. For this criterion, loop drive flow versus pump speed relationship must be verified. Note that recirculation pump speed is directly proportional to recirculation motor generator speed (Reference 5). Therefore, recirculation motor generator speed can be used for the purposes of this surveillance.

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

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

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

This SR is modified by two Notes. If this SR has not been performed in the previous 24 hours at the time an idle recirculation loop is restored to service, Note 1 allows 4 hours after the idle recirculation loop is in operation before the SR must be completed because these checks can only be performed during jet pump operation. The 4 hours is an acceptable time to establish conditions and complete data collection and evaluation.

Note 2 allows deferring completion of this SR until 24 hours after THERMAL POWER is greater than 23% of RTP. During low flow conditions, jet pump noise approaches the threshold

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

The RCS LEAKAGE is monitored by a variety of instruments designed to provide alarms when LEAKAGE is indicated and to quantify the various types of LEAKAGE. Leakage detection instrumentation is discussed in more detail in the Bases for LCO 3.4.6, "RCS Leakage Detection Instrumentation." Sump level and flow rate are typically monitored to determine actual LEAKAGE rates; however, any method may be used to quantify LEAKAGE within the guidelines of Reference 5. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~In conjunction with alarms and other administrative controls, a 12 hour Frequency for this Surveillance is appropriate for identifying LEAKAGE and for tracking required trends (Ref. 6). The leakage limit of ≤ 2 gpm increase in unidentified LEAKAGE within the previous 4 hour period is verified by first determining leakage does not increase by more than 2 gpm in the previous 12 hour period and if leakage is found to have increased by > 2 gpm, determine if a > 2 gpm increase occurred over any 4 hour period.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. GEAP-5620, April 1968.
3. NUREG-76/067, October 1975.
4. FSAR, Section 5.2.5.4.
5. Regulatory Guide 1.45.
6. Generic Letter 88-01, Supplement 1.
7. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

ACTIONS

B.1 and B.2 (continued)

restoration recognizes that at least one other form of leakage detection is available.

C.1 and C.2

If any Required Action of Condition A or B cannot be met within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to perform the actions in an orderly manner and without challenging plant systems.

D.1

With all required monitors inoperable, no required automatic means of monitoring LEAKAGE are available, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.6.2

This SR is for the performance of a CHANNEL FUNCTIONAL TEST of the required RCS leakage detection instrumentation. The test ensures that the monitors can perform their function in the desired manner. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The Frequency of 31 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.~~

SR 3.4.6.3

This SR is for the performance of a CHANNEL CALIBRATION of required leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The Frequency of 24 months is a typical refueling cycle and considers channel reliability.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. Regulatory Guide 1.45, May 1973.
3. FSAR, Section 5.2.5.1.2.
4. GEAP-5620, April 1968.
5. NUREG-75/067, October 1975.
6. FSAR, Section 5.2.5.4.
7. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This Surveillance is performed to ensure iodine remains within limit during normal operation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The 7 day Frequency is adequate to trend changes in the iodine activity level.~~

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

REFERENCES

1. Deleted.

2. FSAR, Section 15.6.4.

3. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

ACTIONS

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

and is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation. Furthermore, verification of the functioning of the alternate method must be reconfirmed every 12 hours thereafter. This will provide assurance of continued temperature monitoring capability.

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

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

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

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

REFERENCES

1. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

ACTIONS

B.1 and B.2 (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

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

REFERENCES

1. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

ACTIONS

B.1 and B.2 (continued)

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

C.1 and C.2

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

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

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1

Verification that operation is within limits (i.e., to the right of the applicable curves in Figures 3.4.10-1 through 3.4.10-3) is required ~~every 30 minutes~~ when RCS pressure and temperature conditions are undergoing planned changes. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature rate of change limits are specified in hourly increments, 30 minutes permits a reasonable time for assessment and correction of minor deviations.~~

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

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.10.7, SR 3.4.10.8, and SR 3.4.10.9 (continued)

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

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

REFERENCES

1. 10 CFR 50, Appendix G.
2. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix G.
3. ASTM E 185-73.
4. 10 CFR 50, Appendix H.
5. Regulatory Guide 1.99, Revision 2, May 1988.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. NEDO-21778-A, December 1978.
8. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).
9. PPL Calculation EC-062-0573, "Study to Support the Bases Section of Technical Specification 3.4.10."
10. FSAR, Section 15.4.4.
11. Regulatory Guide 1.190, March 2001.
12. FSAR, Section 4.1.4.5.

BASES

APPLICABILITY (continued)

pressure is well below the required limit, and no anticipated events will challenge the overpressure limits.

ACTIONS

A.1

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

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Verification that reactor steam dome pressure is ≤ 1050 psig ensures that the initial conditions of the over-pressurization analysis are met. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program~~Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1 (continued)

full of water ensures that the ECCS will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The 31 day Frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls governing system operation, and operating experience.~~

SR 3.5.1.2

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

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

This SR is modified by a Note that allows LPCI subsystems to be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the RHR cut in permissive pressure in MODE 3, if capable of being manually realigned (remote or local) to the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.2 (continued)

LPCI mode and not otherwise inoperable. This allows operation in the RHR shutdown cooling mode during MODE 3, if necessary.

SR 3.5.1.3

Verification ~~every 31 days~~ that ADS gas supply header pressure is ≥ 135 psig ensures adequate gas pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The design pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least one valve actuations can occur with the drywell at 70% of design pressure.

The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ 135 psig is provided by the containment instrument gas system. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The 31 day Frequency takes into consideration administrative controls over operation of the gas system and alarms associated with the containment instrument gas system.~~

SR 3.5.1.4

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.5

Verification ~~every 31 days~~ that each 480 volt AC swing bus transfers automatically from the normal source to the alternate source on loss of power while supplying its respective bus demonstrates that electrical power is available to ensure proper operation of the associated LPCI inboard injection and minimum flow valves and the recirculation pump discharge and bypass valves. Therefore, each 480 volt AC swing bus must be OPERABLE for the associated LPCI subsystem to be OPERABLE. The test is performed by actuating the load test switch or by disconnecting the preferred power source to the transfer switch and verifying that swing bus automatic transfer is accomplished. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The 31 day Frequency has been found to be acceptable through operating experience.~~

SR 3.5.1.6

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

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.7, SR 3.5.1.8, and SR 3.5.1.9 (continued)

completed and there is no indication or reason to believe that HPCI is inoperable.

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

The Frequency for SR 3.5.1.7 and SR 3.5.1.8 is in accordance with the Inservice Testing Program requirements. The Surveillance Frequency for SR 3.5.1.9 is controlled under the Surveillance Frequency Control Program. ~~. The 24 month Frequency for SR 3.5.1.9 is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.5.1.10

The ECCS subsystems are required to actuate automatically to perform their design functions. This Surveillance verifies that, with a required system initiation signal (actual or simulated), the automatic initiation logic of HPCI, CS, and LPCI will cause the systems or subsystems to operate as designed, including actuation of the system throughout its emergency operating sequence, automatic pump startup and actuation of all automatic valves to their required positions. This functional test includes the LPCI and CS interlocks between Unit 1 and Unit 2 and specifically requires the following:

A functional test of the interlocks associated with the LPCI and CS pump starts in response to an automatic initiation signal in Unit 1 followed by a false automatic initiation signal in Unit 2;

A functional test of the interlocks associated with the LPCI and CS pump starts in response to an automatic initiation signal in Unit 2 followed by a false automatic initiation signal in Unit 1; and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.10 (continued)

> A functional test of the interlocks associated with the LPCI and CS pump starts in response to simultaneous occurrences of an automatic initiation signal in both Unit 1 and Unit 2 and a loss of Offsite power condition affecting both Unit 1 and Unit 2.

The purpose of this functional test (preferred pump logic) is to assure that if a false LOCA signal were to be received on one Unit simultaneously with an actual LOCA signal on the second Unit, the preferred LPCI and CS pumps are started and the non-preferred LPCI and CS pumps are tripped for each Unit. This functional test is performed by verifying that the non-preferred LPCI and CS pumps are tripped. The verification that preferred LPCI and CS pumps start is performed under a separate surveillance test. Only one division of LPCI preferred pump logic is required to be OPERABLE for each Unit, because no additional failures needs to be postulated with a false LOCA signal. If the preferred or non-preferred pump logic for CS is inoperable, the associated CS pumps shall be declared inoperable and the pumps should not be operated to ensure that the opposite Unit's CS pumps or 4.16 kV ESS Buses are protected.

This SR also ensures that the HPCI System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlaps this Surveillance. This SR can be accomplished by any series of sequential overlapping or total steps such that the entire channel is tested.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The 24 month Frequency is acceptable because operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.11

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

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

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

SR 3.5.1.12

A manual actuation of each ADS valve is performed to verify that the valve and solenoid are functioning properly. This is demonstrated by one of the two methods described below. Proper operation of the valve tailpipes is ensured through the use of foreign material exclusion during maintenance.

One method is by manual actuation of the ADS valve under hot conditions. Proper functioning of the valve and solenoid is demonstrated by the response of the turbine control or bypass valve or by a change in the measured flow or by any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve due to seat impact during closure. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the ADS valves divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this SR. Adequate pressure at which this SR is to be performed is 150 psig. However, the requirements of SR 3.5.1.12 are met by a successful performance at any pressure. Adequate steam flow is represented by at least 1.25 turbine bypass valves open. Reactor startup is allowed prior to performing this SR by this method because valve OPERABILITY and the setpoints for

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.12 (continued)

overpressure protection are verified, per ASME requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed for manual actuation after the required pressure is reached is sufficient to achieve stable conditions and provides adequate time to complete the Surveillance.

Another method is by manual actuation of the ADS valve at atmospheric temperature and pressure during cold shutdown. When using this method, proper functioning of the valve and solenoid is demonstrated by visual observation of actuator movement. Actual disc travel is measured during valve refurbishment and testing per ASME requirements. Lifting the valve at atmospheric pressure is the preferred method because lifting the valves with steam flow increases the likelihood that the valve will leak. The Note that modifies this SR is not needed when this method is used because the SR is performed during cold shutdown.

SR 3.5.1.11 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The Frequency of 24 months on a STAGGERED TEST BASIS ensures that both solenoids for each ADS valve are alternately tested. The Frequency is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.5.1.13

This SR ensures that the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is less than or equal to the maximum value assumed in the accident analysis. Response Time testing acceptance criteria are included in Reference 13. This SR is modified by a Note that allows the instrumentation portion of the response time to be assumed to be based on historical response time data and therefore, is excluded from the ECCS RESPONSE TIME testing. This is allowed since the instrumentation response time is a small part of the ECCS RESPONSE TIME (e.g., sufficient margin exists in the diesel generator start time when compared to the instrumentation response time) (Ref. 14).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.13 (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~The 24-month Frequency is consistent with the typical industry refueling cycle and is acceptable based upon plant operating experience.~~

REFERENCES

1. FSAR, Section 6.3.2.2.3.
2. FSAR, Section 6.3.2.2.4.
3. FSAR, Section 6.3.2.2.1.
4. FSAR, Section 6.3.2.2.2.
5. FSAR, Section 15.2.4.
6. FSAR, Section 15.2.5.
7. FSAR, Section 15.2.6.
8. 10 CFR 50, Appendix K.
9. FSAR, Section 6.3.3.
10. 10 CFR 50.46.
11. FSAR, Section 6.3.3.
12. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
13. FSAR, Section 6.3.3.3.
14. NEDO 32291-A, "System Analysis for the Elimination of Selected Response Time Testing Requirements, October 1995.
15. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1 and SR 3.5.2.2 (continued)

the other required ECCS subsystem has adequate makeup volume.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool water level and CST water level variations and instrument drift during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool or CST water level condition.~~

SR 3.5.2.3, SR 3.5.2.5, SR 3.5.2.6, and SR 3.5.2.7

The Bases provided for SR 3.5.1.1, SR 3.5.1.7, SR 3.5.1.10, and SR 3.5.1.13 are applicable to SR 3.5.2.3, SR 3.5.2.5, SR 3.5.2.6 and SR 3.5.2.7, respectively.

SR 3.5.2.4

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The 31 day Frequency is appropriate because the valves are operated under procedural control ad the probability of their being mispositioned during this time period is low.~~

In MODES 4 and 5, the RHR System may operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. Therefore, RHR valves that are required for LPCI

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in a orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

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

SR 3.5.3.2

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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.2 (continued)

~~31 days is further justified because the valves are operated under procedural control and because improper valve position would affect only the RCIC System. This Frequency has been shown to be acceptable through operating experience~~.

SR 3.5.3.3 and SR 3.5.3.4

The RCIC pump flow rates ensure that the system can maintain reactor coolant inventory during pressurized conditions with the RPV isolated. The flow tests for the RCIC System are performed at two different pressure ranges such that system capability to provide rated flow is tested both at the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the RCIC System diverts steam flow. Reactor steam pressure is considered adequate when ≥ 920 psig to perform SR 3.5.3.3 and ≥ 150 psig to perform SR 3.5.3.4. However, the requirements of SR 3.5.3.4 are met by a successful performance at any pressure ≤ 165 psig. Adequate steam flow is represented by at least 1.25 turbine bypass valves open. Therefore, sufficient time is allowed after adequate pressure and flow are achieved to perform these SRs. Reactor startup is allowed prior to performing the low pressure Surveillance because the reactor pressure is low and the time allowed to satisfactorily perform the Surveillance is short. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed that the low pressure Surveillance has been satisfactorily completed and there is no indication or reason to believe that RCIC is inoperable. Therefore, these SRs are modified by Notes that state the Surveillances are not required to be performed until 12 hours after the reactor steam pressure and flow are adequate to perform the test.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.
~~The Frequency for SR 3.5.3.3 is determined by the Inservice Testing Program requirements. The 24 month Frequency for SR 3.5.3.4 is based on the need to perform the Surveillance under conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.3 and SR 3.5.3.4 (continued)

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

SR 3.5.3.5

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

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

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

REFERENCES

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

2. FSAR, Section 5.4.6.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1.2 *(continued)*

and also in view of the fact that component failures that might have affected this test are identified by other primary containment SRs. Two consecutive test failures, however, would indicate unexpected primary containment degradation; in this event, as the Note indicates, increasing the Frequency ~~to once every 24 months~~ is required until the situation is remedied as evidenced by passing two consecutive tests. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.1.1.3

Maintaining the pressure suppression function of primary containment requires limiting the leakage from the drywell to the suppression chamber. Thus, if an event were to occur that pressurized the drywell, the steam would be directed through downcomers into the suppression pool. This SR measures suppression chamber-to-drywell vacuum breaker leakage to ensure the leakage paths that would bypass the suppression pool are within allowable limits. The total allowable leakage limit is 30% of the SR 3.6.1.1.2 limit. The allowable leakage per set is 12% of the SR 3.6.1.1.2 limit.

The leakage is determined by establishing a 4.3 psi differential pressure across the drywell-to-suppression chamber vacuum breakers and verifying the leakage. ~~The leakage test is performed every 24 months. The 24 month Frequency was developed considering the surveillance must be performed during a unit outage.~~ A Note is provided which allows this Surveillance not to be performed when SR 3.6.1.1.2 is performed. This is acceptable because SR 3.6.1.1.2 ensures the OPERABILITY of the pressure suppression function including the suppression chamber-to-drywell vacuum breakers. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. FSAR, Section 6.2.
2. FSAR, Section 15.
3. 10 CFR 50, Appendix J, Option B.
4. Nuclear Energy Institute, 94-01

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.1 (continued)

criteria were established based on engineering judgement and industry operating experience. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

The SR has been modified by two Notes, Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 requires the results of airlock leakage tests be evaluated against the acceptance criteria of the Primary Containment Leakage Testing Program, 5.5.12. This ensures that the airlock leakage is properly accounted for in determining the combined Type B and C primary containment leakage.

SR 3.6.1.2.2

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure, closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when primary containment is used for entry and exit (procedures require strict adherence to single door openings), 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 conditions that apply during a plant outage, and the potential for loss of primary containment OPERABILITY, if the surveillance were performed with the reactor at power. The 24 month frequency for the interlock is justified based on generic operating~~

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BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.1.2.2 (continued) ~~experience. The 24 month Frequency is based on engineering judgment and is considered adequate given the interlock is not challenged during the use of the air lock.~~
REFERENCES (continued)	1. FSAR, Section 3.8.2.1.2. 2. 10 CFR 50, Appendix J, Option B. 3. FSAR, Section 6.2. 4. Final Policy Statement on Technical Specifications Improvements July 22, 1993 (58 FR 39132).

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.1 (continued)

limited periods of time. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~The 31 day Frequency is consistent with other PCIV requirements discussed in SR 3.6.1.3.2.~~

SR 3.6.1.3.2

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

This SR does not require any testing or valve manipulation. Rather, it involves verification that those PCIVs outside primary containment, and capable of being mispositioned, are in the correct position. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. ~~Since verification of valve position for PCIVs outside primary containment is relatively easy, the 31 day Frequency was chosen to provide added assurance that the PCIVs are in the correct positions.~~

Two Notes have been added to this SR. The first Note allows valves and blind flanges located in high radiation areas to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable since access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these PCIVs, once they have been verified to be in the proper position, is low. A second Note has been included to clarify that PCIVs that are open under administrative controls are not required to meet the SR during the time that the PCIVs are open. 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.

SR 3.6.1.3.3

This SR verifies that each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked, sealed, or otherwise

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SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.3 (continued)

secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design limits. For PCIVs inside primary containment, the Frequency defined as "prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days" is appropriate since these PCIVs are operated under administrative controls and the probability of their misalignment is low. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing. Two Notes have been added to this SR. The first Note allows valves and blind flanges located in high radiation areas to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable since the primary containment is inerted and access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these PCIVs, once they have been verified to be in their proper position, is low. A second Note has been included to clarify that PCIVs that are open under administrative controls are not required to meet the SR during the time that the PCIVs are open.

SR 3.6.1.3.4

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

SR 3.6.1.3.5

Verifying the isolation time of each power operated and each automatic PCIV is within limits is required to demonstrate OPERABILITY. MSIVs may be excluded from this SR since MSIV

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SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.5 (continued)

full closure isolation time is demonstrated by SR 3.6.1.3.7. The isolation time test ensures that the valve will isolate in a time period less than or equal to that assumed in the Final Safety Analyses Report. The isolation time and Frequency of this SR are in accordance with the requirements of the Inservice Testing Program.

SR 3.6.1.3.6

For primary containment purge valves with resilient seals, the Appendix J Leakage Rate Test Interval ~~of 24 months~~ is sufficient. The acceptance criteria for these valves is defined in the Primary Containment Leakage Rate Testing Program, 5.5.12.

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

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

SR 3.6.1.3.7

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

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