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DTE Energy

September 16, 2014
NRC-14-0065

10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

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

Subject: License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

In accordance with the provisions of 10 CFR 50.90, DTE Electric Company (DTE) is submitting a request for an amendment to the technical specifications (TS) for Fermi 2.

The proposed amendment would modify TS by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04–10, ''Risk-Informed Technical Specification Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies.''

Enclosure 1 provides a description of the proposed changes, the requested confirmation of applicability, and plant-specific verifications. Enclosure 2 provides documentation of PRA technical adequacy. Enclosure 3 provides the existing TS pages marked up to show the proposed changes. Enclosure 4 provides the existing TS Bases pages marked up to show the proposed changes, for information only. Enclosure 5 provides a cross-reference between the TSTF-425 marked up TS pages and the Fermi 2 TS pages. Enclosure 6 provides the No Significant Hazards Consideration.

DTE requests approval of the proposed License Amendment by September 16, 2015, with the amendment being implemented within 120 days.

In accordance with 10 CFR 50.91, a copy of this application, with enclosures, is being provided to the designated Michigan State Official.

Should you have any questions or require additional information, please contact Mr. Alan I. Hassoun of my staff at (734) 586-4287.

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

Executed on September 16, 2014

V. A. Kaminskas
Site Vice President

Enclosures:

1. Evaluation of the Proposed License Amendment
2. Documentation of PRA Technical Adequacy
3. Marked-up pages of Existing Fermi 2 TS
4. Marked-up pages of Existing Fermi 2 TS Bases (For Information Only)
5. Technical Specification Cross-Reference for Fermi 2 and TSTF-425 Mark-ups
6. Proposed No Significant Hazards Consideration

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 5, Region III
Regional Administrator, Region III
Michigan Public Service Commission
Regulated Energy Division (kindschl@michigan.gov)

Enclosure 1 to
NRC-14-0065

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

Evaluation of the Proposed License Amendment

Evaluation of the Proposed License Amendment

1.0 Description

The proposed amendment would modify 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 the Fermi 2 TS Section 5.5, “Programs and Manuals.”

The changes are consistent with Nuclear Regulatory Commission (NRC) approved Industry/TSTF STS change TSTF–425, Revision 3 (ADAMS Accession No. ML09085064). The availability of the TS improvement was published in the *Federal Register* on July 6, 2009 (74 FR 31996).

2.0 Assessment

2.1 Applicability of Published Safety Evaluation

DTE Electric Company (DTE) has reviewed the safety evaluation dated July 6, 2009. This review included a review of the NRC staff’s evaluation, TSTF–425, Revision 3, and the requirements specified in NEI 04– 10, Rev. 1, (ADAMS Accession No. ML071360456).

Enclosure 2 includes DTE documentation with regard to probabilistic risk assessment (PRA) technical adequacy consistent with the requirements of Regulatory Guide 1.200, Revision 1 (ADAMS Accession No. ML070240001), Section 4.2, and describes any PRA models without NRC endorsed standards, including documentation of the quality characteristics of those models in accordance with Regulatory Guide 1.200.

DTE has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to Fermi 2 and justify this amendment to incorporate the changes to the Fermi 2 TS.

2.2 Optional Changes and Variations

The proposed amendment is consistent with the STS changes described in TSTF-425, Revision 3; however, DTE proposes the following variations or deviations from TSTF-425:

- Revised (typed) TS pages are not included in this amendment request given the number of TS pages affected, the straightforward nature of the proposed changes, and other pending Fermi 2 license amendment requests that impact some of the same TS pages. Providing only mark-ups of the proposed TS changes satisfies the requirements of 10 CFR 50.90 in that the mark-ups fully describe the changes desired. This represents an administrative

deviation from the NRC staff's model application dated July 6, 2009 (74 FR 31996) with no impact on the NRC staff's model safety evaluation published in the same Federal Register Notice. As a result of this deviation, the contents and numbering of the enclosures for this amendment request differ from the enclosures specified in the NRC staff's model application. This deviation is consistent with many other industry applications adopting TSTF-425 (Examples, NRC Accession No. ML100480339 and ML100890320).

- The definition of STAGGERED TEST BASIS is being retained in Fermi 2 TS Definition Section 1 since this terminology is mentioned in TS Programs and Manuals Section 5.5.14, "Control Room Envelope Habitability Program," which is not the subject of this amendment request and is not proposed to be changed. This represents an administrative deviation from TSTF-425 with no impact on the NRC staff's model safety evaluation dated July 6, 2009 (74 FR 31996).

- NRC letter dated April 14, 2010 (ML100990099) provides a change to an optional insert (INSERT #2) to the existing TS Bases to facilitate adoption of the Traveler. The TSTF-425 TS Bases insert states the following:

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

  This statement only applies to frequencies that have been changed in accordance with the Surveillance Frequency Control Program (SFCP) and does not apply to frequencies that are relocated but not changed. Consistent with NUREG-1433 Revision 4 (ML12104A193), DTE has replaced the TSTF-425 TS Bases Insert #2 with the following:

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

- Enclosure 5 provides a cross-reference between the NUREG-1433 Surveillance Requirements (SRs) included in TSTF-425 versus Fermi 2 TS. This Enclosure includes a summary description of the referenced TSTF-425/Fermi 2 TS SRs which is being provided for information purposes only and is not intended to be a verbatim description of the TS SRs. This cross-reference highlights the following:

  1. SRs included in TSTF-425 and corresponding Fermi 2 SRs with identical SR numbers;

  2. SRs included in TSTF-425 and corresponding Fermi 2 SRs with differing SR numbers;

  3. SRs included in TSTF-425 that are not contained in the Fermi 2 TS; and

  4. Fermi 2 plant-specific SRs that are not contained in the TSTF- 425 mark-ups.

Concerning the above, Fermi 2 SRs that have SR numbers identical to the corresponding TSTF-425 SRs are not deviations from TSTF-425. Fermi 2 SRs with SR numbers that differ from the corresponding TSTF-425 SRs are administrative deviations from TSTF-425 with no impact on the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996).

For TSTF-425 SRs that are not contained in the Fermi 2 TS, the corresponding mark-ups included in TSTF-425 for these SRs are not applicable to Fermi 2. This is an administrative deviation from TSTF-425 with no impact on the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996).

For Fermi 2 plant-specific SRs that are not contained in the mark-ups provided in TSTF-425, DTE has determined that the relocation of the frequencies for these Fermi 2 plant-specific SRs is consistent with the intent of TSTF-425, Revision 3, and with the NRC's model safety evaluation dated July 6, 2009 (74 FR 31996), including the scope exclusions identified in Section 1.0, "Introduction," of the model safety evaluation. The subject plant-specific SRs involve fixed periodic frequencies. In accordance with TSTF-425, changes to the frequencies for these SRs would be controlled under the Surveillance Frequency Control Program. The Surveillance Frequency Control Program provides the necessary administrative controls to require that SRs related to testing, calibration and inspection are conducted at a frequency to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. Changes to frequencies in the Surveillance Frequency Control Program would be evaluated using the NRC approved methodology and probabilistic risk guidelines contained in NEI 04-10, Revision 1.

- SR 3.1.2.1 is included within the scope of this submittal but was not included in TSTF-425, Revision 3. The frequency of SR 3.1.2.1 is encompassed by the intent of TSTF-425, and is included within the scope of the NRC Model Safety Evaluation (ML091800157). The NUREG-1433 markups within TSTF-425 include a similar core exposure based SR frequency (SR 3.3.1.1.6). During the NRC review of TSTF-425, Revision 1, an RAI response from the TSTF specifically identified frequencies based on core exposure to be within the scope of TSTF-425 and NEI 04-10 (ML080280272). In addition, the NRC approved a similar SR frequency relocation for the Hope Creek TSTF-425 License Amendment (ML103410243, SR 4.1.2).

3.0 Regulatory Analysis

3.1 No Significant Hazards Consideration Determination

DTE has reviewed the proposed no significant hazards consideration determination (NSHCD) published in the Federal Register dated July 6, 2009. DTE has concluded that the proposed NSHCD presented in the Federal Register notice is applicable to Fermi 2 and is provided in Enclosure 6 of this amendment request which satisfies the requirements of 10 CFR 50.91(a).

3.2 Commitments

There are no new regulatory commitments contained in this submittal.

3.3 Applicable Regulatory Requirements

A description of the proposed changes and their relationship to applicable regulatory requirements is provided in TSTF-425, Revision 3 and the NRC's model safety evaluation published in the Notice of Availability dated July 6, 2009 (74 FR 31996). DTE has concluded that the relationship of the proposed changes to the applicable regulatory requirements presented in the Federal Register notice is applicable to Fermi 2.

3.4 Conclusions

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

4.0 Environmental Consideration

DTE has reviewed the environmental consideration included in the model safety evaluation dated July 6, 2009. DTE has concluded that the staff's findings presented in the published evaluation are applicable to Fermi 2 and the evaluation is hereby incorporated by reference for this application.

Enclosure 2 to
NRC-14-0065

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

Documentation of PRA Technical Adequacy

Overview

The implementation of the Surveillance Frequency Control Program (also referred to as Technical Specifications Initiative 5b) at the Fermi 2 Nuclear Power Plant will follow the guidance provided by Nuclear Energy Institute (NEI) in NEI 04-10, Revision 1 [Ref 1] in evaluating proposed surveillance test interval (STI; also referred to as "surveillance frequency") changes.

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

- Each proposed STI revision is reviewed to determine whether there are any commitments made (NRC, Nuclear Electric Insurance Limited (NEIL), manufacturer requirements) that may prohibit changing the interval. If there are no related commitments, or the commitments may be changed using a commitment change process, then evaluation of the STI revision would proceed. If a commitment exists and the commitment change process does not permit the change, then the proposed STI revision cannot be implemented. Only after receiving approval to change the commitment could a proposed STI revision proceed.
- A qualitative analysis is performed for each proposed STI revision that involves several considerations as explained in NEI 04-10, Revision 1.
- Each proposed STI revision is reviewed by an expert panel. If the expert panel approves the STI revision, the change is documented, implemented, and made available for future audits by the NRC. If the expert panel does not approve the STI revision, the STI value is left unchanged.
- Performance monitoring is conducted as recommended by the expert panel. In some cases, no additional monitoring may be necessary beyond that already conducted under the Maintenance Rule. The performance monitoring helps to confirm that no failure mechanisms related to the revised test interval become important enough to alter the information provided for the justification of the interval changes.
- The expert panel is responsible for periodic review of performance monitoring results. If it is determined that the time interval between successive performances of a surveillance test is a factor in the unsatisfactory performance of the surveillance, the expert panel will adjust the STI as needed to provide reasonable assurance of continued satisfactory performance.
- In addition to the above steps, the Probabilistic Risk Assessment (PRA) is used, when possible, to quantify the effect of a proposed individual STI revision compared to acceptance criteria in Figure 2 of NEI 04-10, Revision 1. Also, the cumulative impact of all risk-informed STI revisions on all hazards which have a PRA model (i.e., internal events, external events and shutdown) is also compared to the risk acceptance criteria as delineated in NEI 04-10, Revision 1.

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

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

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

Because of the broad scope of potential Initiative 5b applications and the fact that the impact of such assumptions differs from application to application, 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 requests. The purpose of the remaining portion of this appendix is to address the requirements identified in Item 4 above.

Technical Adequacy of the PRA Model

The FermiV10 update to the Fermi 2 PRA model is the most recent evaluation of the risk profile at Fermi 2 for internal event challenges. The Fermi 2 PRA modeling is highly detailed, including

a wide variety of initiating events, modeled systems, operator actions, and common cause events. The PRA model quantification process used for the Fermi 2 PRA is based on the event tree/fault tree methodology.

Fermi 2 employs a multi-faceted approach for establishing and maintaining the technical adequacy and plant fidelity of the PRA model. This approach includes both a proceduralized PRA maintenance and update process and the use of independent peer reviews. The following information describes this approach as it applies to the Fermi 2 PRA.

PRA Maintenance and Update

The Fermi 2 risk management process ensures that the PRA model remains an accurate reflection of the as-built and as-operated plant. This process is defined in the Fermi 2 PRA model maintenance and configuration control program in accordance with the governing procedure. The procedure delineates the responsibilities and guidelines for updating the full power internal events PRA model. It also 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 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.
- Maintenance unavailabilities are captured, and their impact on Core Damage Frequency (CDF) is trended.
- Plant specific initiating event frequencies, failure rates, and maintenance unavailabilities are updated approximately every three years. Longer intervals may be justified if it can be shown that the PRA continues to adequately represent the as-built, as-operated plant. Table 1 shows the brief history of the major Fermi 2 PRA model updates.

In addition to these activities, Fermi 2 risk management procedures provide the guidance for particular risk management, and PRA quality and maintenance activities. This guidance includes:

- Documentation of the PRA model, PRA products, and bases documents.
- The approach for controlling electronic storage of risk management products including PRA update information, PRA models, and PRA applications.
- Guidelines for updating the full power, internal events PRA models for Fermi 2.
- Guidance for use of quantitative and qualitative risk models in support of the On-Line Work Control Process Program for risk evaluations for maintenance tasks (corrective maintenance, preventive maintenance, minor maintenance, surveillance tests and modifications) on systems, structures, and components (SSCs) within the scope of the Maintenance Rule (10CFR50.65(a)(4)).

Plant Changes Not Yet Incorporated into the PRA Model

As part of the PRA evaluation for each STI change request, a review of open items in the Work Request (WR) database for Fermi 2 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 expert panel. If a non-trivial impact is expected, then this may include the performance of additional sensitivity studies or model changes to confirm the impact on the risk analysis.

Applicability of Peer Review Findings and Observations

Several assessments of technical capability have been made, and continue to be planned for the Fermi 2 PRA model. For the current model of record the following assessments were performed and are discussed in the paragraphs below:

- In August 2012, a peer review was held at the Fermi 2 site under the auspices of the Boiling Water Reactor Owners Group (BWROG), using the NEI 05-04 PRA Peer Review process [Ref 10], the ASME PRA Standard ASME/ANS RA-Sa-2009 [Ref 3] and Regulatory Guide 1.200, Rev 2. The 2012 Fermi 2 PRA Peer Review was a full-scope review of all the Technical Elements of the internal events, at-power PRA. The BWROG peer review final report was issued in November 2012 [Ref 4]. All open and closed gaps to meet capability category II of the ASME/ANS PRA Standard are identified in Table 2. A PRA model update was started following issuance of the peer review final report and was completed in April 2013. This update (FermiV9) addressed the gaps described in the peer review. Table 2 contains the actions taken to resolve all gaps.
- The Human Reliability Analysis (HRA) dependency analysis was updated in 2013. Because a different methodology was used to perform the HRA dependency analysis, a focused scope peer review of the HRA dependency analysis was performed using ASME/ANS RA-Sb-2009 and Regulatory Guide 1.200, Rev 2 in February 2014. The peer review team found that the dependency analysis met Capability Category II (CC-II) for all evaluated supporting requirements [Ref 7].
- In April 2014, a focused scope peer review of Other External Hazards was performed using ASME/ANS RA-Sb-2009 and Regulatory Guide 1.200, Rev 2. The peer review team found that the external hazards analysis met CC-II for all evaluated supporting requirements [Ref 8].

Consistency with Applicable PRA Standards

As indicated above, PRA model updates have been performed to address the identified gaps. The Fermi 2 PRA used for this application conforms with the ASME/ANS standard for Probabilistic Risk Assessment of Nuclear Power Plant Applications [Ref 3] as endorsed by RG 1.200 Rev. 2 [Ref 9] for internal events and other external hazards (excluding fire and seismic hazards).

Identification of Key Assumptions

The overall Initiative 5b process is a risk-informed process with the PRA model results providing one of the inputs to the expert panel 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.

The Fermi 2 PRA model does not use the standby failure rate approach, but the demand failure approach. In the demand failure approach, demand failure probabilities were evaluated by Bayesian updating using plant specific failure data (total number of demands and total number of failures) and generic data. Therefore, there is no specific assumption utilized in the Fermi 2 PRA model for standby failure rate.

For evaluating the impact of a STI change for 5b application, the following assumption will be used:

$Qd = \frac{1}{2} \lambda T$

Where Qd: Demand failure probability,
λ: Standby failure rate, and
T: a STI

Therefore, if a STI increased from T0 to T1 by a surveillance frequency change, the demand failure probability will be assumed to increase from Qd to Qd*(T1/T0).

It is also noted that key assumptions may differ based on the system being considered for an STI change. Therefore, for each application of the PRA model, assumptions will be reviewed, key assumptions for a particular application will be identified, and the impact of these key assumptions on the risk insights will be assessed.

External Event Considerations

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

External hazards were evaluated in the Fermi 2 Individual Plant Examination of External Events (IPEEE) submittal in response to the NRC IPEEE Program (Generic Letter 88-20, Supplement 4 (Ref 5)). The IPEEE program was a one-time review of external hazard risk and was limited in its purpose to the identification of potential plant vulnerabilities and the understanding of associated severe accident risks. The results of the Fermi 2 IPEEE study are documented in the

Fermi 2 IPEEE main report. The primary areas of external event evaluation at Fermi 2 were internal fire and seismic.

The internal fire events were addressed by using the Fire-Induced Vulnerability Evaluation (FIVE) methodology [Ref 6]. As such, there are no realistic CDF or LERF values available from the IPEEE to support the STI risk assessment. Currently, a state of the art Fermi 2 Fire PRA model, which will meet appropriate CC-II requirements in the ASME PRA Standard, is being developed. Until the Fire PRA model is complete and peer reviewed, the IPEEE analysis will be used, consistent with NEI 04-10, and the fire risk insights will be complemented by conservative qualitative potential impact of the fire hazard.

In the Fermi 2 IPEEE, the seismic risk evaluation was performed in accordance with EPRI Seismic Margins Analysis (SMA) methodology. Since the SMA approach was used, there are no comprehensive CDF and LERF values available from the seismic analysis in the Fermi 2 IPEEE to support the STI risk evaluations. A conclusion from the SMA was that Fermi 2 has a high-confidence-low-probability-of-failure (HCLPF) capacity of at least 0.3 peak ground acceleration. Currently, a state of the art Fermi 2 Seismic PRA model, which will meet appropriate CC-II requirements in the ASME PRA Standard, is being developed. Until the Seismic PRA model is complete and peer reviewed, the IPEEE analysis will be used, consistent with NEI 04-10, and the seismic risk insights will be complemented by conservative qualitative potential impact of the seismic hazard.

Fermi 2 performed an evaluation of all external hazards (39 total hazards including internal fire, internal flooding, seismic, high winds, tornados, external floods, transportation accidents, nearby facility accidents, and release of onsite chemicals). The result of this evaluation was that 36 external hazards were screened with respect to CDF and LERF risk. Only internal flooding, internal fire, and seismic activity require detailed PRAs. The risk screening of hazards implies that each hazard has a mean CDF significantly lower than 1E-06/year. This evaluation of all external hazards was reviewed by a peer review team in April 2014 using ASME/ANS RA-Sb-2009 and Regulatory Guide 1.200, Rev 2. All supporting requirements were met to CC-II.

The NEI 04-10 methodology allows for STI change evaluations to be performed in the absence of quantifiable PRA models for all external hazards. Therefore, for fire and seismic risk assessments, until new Fermi 2 fire and seismic PRA models which meet appropriate CC-II requirements in the ASME PRA standard are built, the impacts on fire and seismic risk of an STI change will be assessed using a qualitative or a bounding approach supplemented with insights from IPEEE fire and seismic analyses and from the Fermi 2 internal events PRA model.

Summary

The Fermi 2 PRA maintenance and update processes and technical capability evaluations described above provide a robust basis for concluding 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.

References

1. NEI 04-10 "Risk Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document", 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", US Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Revision 1, January 2007.
3. ASME/ANS RA-Sa-2009, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications." Addendum A of ASME RA-S-2008), February 2009.
4. Enrico Fermi 2 Nuclear Power Plant PRA Peer Review Report Using ASME/ANS PRA Standard Requirements, Final Report, November 2012.
5. NRC Generic Letter 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities – 10 CFR 50.54(f), Supplement 4", June 1991.
6. TR-100370, "Fire-Induced Vulnerability Evaluation (FIVE)", Final Report, April 1992.
7. Enrico Fermi 2 Nuclear Power Plant Focused Scope PRA Peer Review Report Using ASME/ANS PRA Standard Requirements, Final Report, April 2014.
8. Fermi 2 Nuclear Power Station Other External Hazards PRA Peer Review Report Using ASME/ANS PRA Standard Requirements, Final Report, June 2014.
9. Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for risk-Informed Activities", US Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Revision 2, March 2009.
10. NEI 05-04, "Process for Performing PRA Peer Reviews Using the ASME PRA Standard (Internal Events)", Revision 2, November 2008.

Table 1 – History of the Major Fermi 2 PRA Model Updates				
Model (Year Issued)	Description	CDF (Per Yr)	LERF (Per Yr)	Includes Internal Flooding[2]
PLG-0676 (1989)	Original Fermi 2 PRA.	2.2E-05	NA	No
IPE (1992)	Model developed in response to NRC Generic Letter 88-20.	5.7E-06	8.0E-07	No
PSA97C (1997)	RISKMAN model which was reviewed using the NEI Peer Review process.	7.1E-06	1.2E-06	No
FermiV2 (2002)	CDF Model converted from RISKMAN to CAFTA.	5.0E-06	N/A	No
FermiV3 (2002)	Normal PRA Maintenance and CAFTA Level 2 Model developed.	3.3E-06	2.5E-07	No
FermiV4 (2003)	Model updated as part of normal PRA Maintenance.	5.8E-06	9.3E-07	Yes[3]
FermiV5 (2004)	Model updated was part of the Extended Power Uprate (EPU) evaluation (Model was not issued)[1].	N/A	N/A	Yes[3]
FermiV6 (2004)	Model updated as part of normal PRA Maintenance.	6.1E-06	4.8E-07	Yes[3]
FermiV7 (2006)	Model updated to close all A and B NEI Peer Review Findings & Observations which may have impact Mitigating Systems Performance Index (MSPI) results.	1.4E-05	5.5E-07	Yes[3]
FermiV8 (2010)	Periodic update to incorporate accident sequence changes to improve MSPI margin and to address the backlog of identified issues in the modeling database.	2.3E-06	3.1E-07	Yes[3]
FermiV9 (2013)	Complete model upgrade including Initiating Events, Success criteria, Data, System Notebooks, HRA, Internal Flood, MAAP 4.0.7 Analyses, and Level 2/LERF.	1.5E-06	3.7E-07	Yes
FermiV10 (2014)	Update the HRA Dependency Analysis to a different methodology.	1.7E-06	3.6E-07	Yes

(1) EPU was not implemented at Fermi 2.
(2) Includes Internal Flood Initiating Events.
(3) Limited scope internal flooding model based on PLG analysis.

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
1-22 / Addressed SR QU-C2 Not Met	The current approach of using a single such event that is applied to most post-initiator and recovery HFEs, using a single joint probability, while probably generally conservative, may introduce non-conservatisms in specific cases. The probabilities of the events included in the HE1D-D-OPERATOR event range from the E-2 range down to the E-4 range. A cutset containing only two E-2 HFEs would be underestimated by the 1E-6 global value. Additional sensitivity studies should be performed. The Uncertainty notebook includes a sensitivity study with all HEPs increased to the 95 percentile, which results in a factor of 3 increase in CDF. However, the assigned error factor for HE1D-D-OPERATOR is set to 10, which may understate its uncertainty.	A sensitivity model was created that allowed the cutsets to show which critical actions are failing within cutsets that include dependent HEP events. After quantification of the sensitivity model, those cutsets that included the global dependent HEP were output to the HRA Notebook. This table includes the top 100 cutsets which include the global dependent HEP. It can be seen from these cutsets that the global dependent HEP represents unusual and low probability combinations of HEPs; as it was designed. The topmost cutsets involve loss of GSW events where operators fail to refill the CST and/or fail to defeat high area temperature isolation of RCIC. Such events have a multi-hour system window, diverse cues, varied cognitive challenges, and ample recovery options such that dependency is low. The review of the cutsets from the sensitivity model confirm that the use of the global HEP, HE1D-D-OPERATOR, properly engenders the dependency for combinations of HEPs that are only loosely dependent. The joint probability assigned is realistic for risk significant cutsets that include the global dependency event so this SR meets Capability Category II.
1-26 / Closed SR IEFV-A7 Not Met	As noted in section 2.2.9.1 of EF2-PRA-012, maintenance-induced floods were not included on the basis of the fact that only a few minor floods occurred over the past few years. However, past history has shown that significant floods can occur due to	Supporting requirement IFEV-A7 is considered to be met because generic data was considered in the evaluation (as revised by the information presented in the resolution to this finding). The evaluation is complete and has been added to the internal

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
	maintenance errors, especially on large volume systems such as circulating water, fire protection, condensate, etc. Historical data (as tabulated in Appendix H) confirms the existence of such events, although none have recently occurred. The Fermi 2 internal flooding PRA should consider maintenance-induced flood events on at least the large water volume systems.	flood analysis under the discussion of maintenance induced floods. The large Circ. Water failure flooding the Turbine Building is increased by 1E-3/Rx Yr to reflect this calculated maintenance induced failure frequency. As maintenance induced floods have been evaluated and the frequencies updated in the model, this SR meets Capability Category II.
2-16 / Addressed SR HR-G7 Not Met	It was noted that an HEP dependency analysis was performed. However, in Section 5.3.2.2 of Fermi 2 HRA Notebook (EF2-PRA-004), it is stated that the chronological sequencing of HEPs is not used as a criterion in the dependency quantification. SR HR-G7 indicates however that the dependency analysis must account for the influence of success or failure in preceding human actions and system performance on the human event under consideration. Therefore the order in which the operator is presented with opportunities in an accident sequence is important and must be considered. Although it was stated that the chronology of the events is not known with precision when modeling groups of events, which is the approach taken by the Fermi 2 HRA analysis, the order in which the HFEs occur in any one cut set or scenario should be apparent. Any alternative	A review of the HRA dependencies was performed to understand previous failures and successes. Examples of intervening successes were identified and cited in the HRA notebook. Previous failures are included in the dependency treatment by explicitly including the dependency failure probability, or by setting it as a guaranteed failure. Further discussion on chronology while using BWR EOPs was included in the HRA notebook including how the approach taken leads to a robust assessment of dependent HEP groups. Multiple examples of the conservative nature of the dependency analysis are provided. It is also identified that HRA dependency treatment is a key source of modeling uncertainty and as such explicit sensitivity studies are included in the Uncertainty Notebook. As discussion on the intervening success and failures is addressed and the conservative nature of the dependency analysis is described, this SR meets Capability Category II.

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
	approaches used that vary from industry standards must be documented and studies performed to demonstrate the appropriateness of the approach used.	
3-15 / Closed SR DA-D4 Capability Category I	There was no formal examination of the Bayesian posterior values for reasonableness. Therefore, this SR is not met. (DA-D4)	The discussion is inserted into the Data Notebook describing the review of the data posteriors after the Bayesian update. It should be noted that a reasonability check was performed as part of the review of the Component Data analysis prior to the Peer Review; however, there was nothing in the documentation stating that this reasonability check had been performed. As the review of data posteriors is now included in the Data Notebook, this SR meets Capability Category II.
3-28 / Addressed SR HR-G7 Not Met	It was noted that for the evaluation of the group of HEPs in Section D.3.2.3 of the Fermi 2 HRA Notebook (EF2-PRA-004), the use of the event HEIFRXPCHSML (a steam LOCA) to represent cutsets in which HEIFRXPCHWML (a water LOCA) was non-conservative. The steam LOCA HEP is 1.0E-3, compared to 4.6E-2 for the water LOCA.	A review was performed to identify those actions that may dependent during a medium water LOCA. A new dependent operator action was created based on the short amount of time that two actions could be demanded. If feedwater fails and auto-actuation of HPCI fails, two actions are required within 6 minutes and have similar cues (i.e., low RPV water level). Therefore, for these two actions a separate dependent HEP is created and inserted into the model. Based on these factors, the dependency between these actions is HIGH. Based on accident sequence review, the HE1FRXPCHWML, "Operator fails to depressurize (Medium Water LOCA)" HEP can be used as the independent failure and the other failure is assumed bounded by the dependent value. This action is identified as HE1D-D-HPIMLW. A broad review of

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
		dependent HEPs was performed to ensure independent HEPs are properly represented as well as their dependencies. These reviews address completeness and reasonableness of the dependent HEP treatment. Based on the actions taken, this SR meets Capability Category II.
4-9 / Closed SR IE-A7 Not Met	To address item SR IE-A7 (a), section 2.4 and Appendix I include industry Operating Experience summaries that include some low power and shutdown events, but may not include all events that occurred at Fermi 2 (e.g., if they were not significant enough to warrant inclusion in industry databases). Appendix J also considers some shutdown events for at-power applicability, but this appendix is based on generic industry initiator lists and does not consider Fermi 2-specific experience. While operations and system engineer interviews that were performed for the SY and HR notebook development tasks asked about potential initiators, the responses are probably limited to only those systems modeled in the PRA and those initiators that may be related to the specific operator actions being investigated. While the above items provide some review of the items required by this SR, these interviews/reviews	To address the question with this finding regarding plant-specific initiators in shutdown (or during low power operation) that are applicable to power operation, a search was performed for such events at Fermi 2. Based upon this search, an event during low power operation (see LER 2007-002) was analyzed and conservatively included as a plant-specific turbine trip event in the Bayesian update process for the Turbine Trip (%TX) initiator. The IE frequency for this initiator was adjusted based upon this information (a very minor change in the mean value occurred). Documentation changes were incorporated into the IE Notebook. As an evaluation of shutdown and lower power events has been completed and the results incorporated into the model, this SR meets Capability Category II.

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
	were conducted for different purposes than this SR addresses. Hence, the requirements for this SR are only partially met.	
4-16 / Closed SR QU-D4 Capability Category I	Section 4.6 of the Quantification Notebook, EF2-PRA-013, provides a comparison of CDF and accident class to other BWR plants. However, this comparison fails to explain why the CDF at Fermi 2 is less than or equal to half the CDF of all of the other plants. In addition, there is no breakdown of how the various initiators compare to the other plants such as turbine trip, loss of condenser, etc. that could be used to explain where the major reductions in CDF at Fermi 2 come from and why they are appropriate.	The Quantification Notebook was revised to reference the comparison of the results from a similar plant included in the Uncertainty Analysis Notebook and to explicitly discuss the significant differences. As this comparison is documented in the Quantification Notebook and the differences are explained, this SR meets Capability Category II.
4-21 / Closed SR IFSN-A6 Not Met	Section 2.2.5 of the Internal Flood Analysis Notebook, EF2-PRA-012, credits the analysis done in the UFSAR to justify not assessing component damage from missiles, pipe whip, and the jet force of fluid discharge for safety-related systems, but does not address the effect of those events on non-safety systems. Section B.2.1 states that the effects of humidity, condensation, temperature, pipe whip, and jet impingement on equipment operability are assessed to be non-significant impacts based on section 2.2. Since the quoted section of the UFSAR did not	The listed mechanisms were assessed qualitatively and were found not to contribute to the Reactor Building flooding events because of the equipment qualification program at Fermi 2. The Auxiliary Building internal flooding scenarios (with the exception of those emanating from the RBCCW Room, which is considered to be part of the Turbine Building for the purpose of this discussion and these emanating from the HPCI/CRD Pump Room which are considered to be part of the Reactor Building for the purpose of this discussion) involve low pressure, low temperature systems that do not pose challenges to other systems due to pipe whip, jet

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
	address humidity, condensation, or temperature and did not consider jet impingement or pipe whip for non-safety systems, the basis for neglecting the effects does not appear to be valid.	impingement, or high humidity. Therefore, these considerations are not relevant for scenarios in that building. For equipment in the Turbine Building, the conservative assessment is included to assume failure of all equipment in the building given a failure associated with the specified mechanisms. As the flooding effects on non-safety related equipment have been evaluated and the results updated in the model, this SR meets Capability Category II.
4-22 / Closed SR IFSN-A7 Not Met	In Section 2.2.7 of the Internal Flood Analysis Notebook, EF2-PRA-012, and Section 7.3.2.2.9 of the UFSAR is referenced to state that MOVs outside the containment have weatherproof type enclosures. Section 7.3.2 of the UFSAR covers the Containment and Reactor Vessel Isolation Control System (CRVICS), and sub-section 7.3.2.2.9 discusses CRVICS valves. The statement in the UFSAR is not a global statement about all MOVs in the plant. In the Internal Flood Walkdown Summary Notebook, EF2-PRA-011, picture 251 shows an MOV in the plant that does not appear to be inside a weatherproof enclosure. The rationale for screening MOVs from spray effects does not appear to be valid. Picture 248 in the IF Walkdown Notebook shows two AOV and SOVs which also do not appear to be protected from spray.	The treatment of MOVs and other components with respect to spray in the internal flood model includes several layers of investigation: • Walkdown evaluation • Use of design and deterministic criteria for Reactor Building Equipment • Comparison of the design, installation, and maintenance treatment of safety related and non-safety related, PRA credited valves in the Reactor Building • Conservative treatment of MOVs in Turbine Building These are discussed as follows: 1. The safety related valves located in the Reactor Building are qualified for HELB conditions and are therefore considered robust in their ability to survive spray effects. 2. SSCs are assumed failed if the SSC is submerged. For the

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
		assessment of spray impacts on SSCs, the primary emphasis is on electrical equipment that could cause failures of multiple pieces of equipment. EPRI document 1019194, December 2009 "Guidelines for Performance of Internal Flooding Probabilistic Risk Assessment", indicates the following with respect to water spray effects: • Water spray is assumed to fail electrical equipment such as switchgear and motor control centers (MCCs), unless protected by suitably installed shields. The evaluation should differentiate between moderate-energy piping systems (maximum operating pressure less than 275 psig) and high-energy piping systems. For Fermi 2, the switchgear and MCCs are explicitly evaluated for spray effects. This is documented in Appendix B.5 where it is stated that the EPRI guidelines for internal flooding analysis are followed which require the examination of spray effects on switchgear and MCCs. 3. The valves that are cited in the proposed finding are: • Picture 251: There are no spray sources that can affect this valve. Rupture failure of General Service Water (GSW) fails all mitigation equipment in the Turbine Building. • Picture 248: The two AOVs and SOVs are BOP hotwell makeup valves. As pointed out, these valves are assumed

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
		to fail for all floods in the Turbine Building. Therefore, no credit is attached to these for flood scenarios and no other systems are present (as shown in the picture) such that spray from another system can simultaneously fail these valves and an additional mitigation system. 4. The Fermi 2 MOV/AOV Valve Engineer examined the Internal Flooding Walkdown documentation with respect to the valves (including SOVs) identified in the pictures discussed in this finding and also regarding non-safety related, PRA-credited valves. It was noted that the valves in the pictures were very similar to valves throughout the plant, including safety related valves, in terms of spray resistance. It was also his judgment (based upon information in the response to Finding 4-21) that, since safety related and non-safety related, PRA-credited valves in the plant are similar in design, installation, and maintenance treatment, the two classes of valves would perform similarly during spray events. Based on the Fermi 2 implementation of the EPRI Internal Flood Guidelines that require a search for spray effects on MCCs and switchgear and the information presented here regarding spray effects on valves this SR meets Capability Category II.

Table 2 – Resolution of Fermi 2 Internal Events Peer Review F&Os Associated with not Meeting Capability Category II		
F&O / Status / SR Capability Category	**Finding**	**Resolution**
5-7 / Closed SR HR-G6 Not Met	Human Reliability Analysis (EF2-PRA-004) Section 3.13 was reviewed and determined not to meet the intent of this SR. Section 3.13 of the HRA notebook simply reviews Fermi 2 human performance indicators and attempts to draw a correlation to this SR. Table 5-4 does not provide a means to evaluate HFEs given the scenario context of an accident sequence. A review of Table 5-4 did not reveal that a comparison for reasonableness was made at the time of the analysis. 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.	A comparison of the Human Failure Events (HFEs) is provided to assess the reasonableness of the Human Error Probabilities (HEPs). The HEPs are ranked by their HEP value. Then a comparison is made of all of the HEPs within a single decade. This comparison shows that the HEPs are consistently assessed quantitatively with respect to each other. Finally, the HEPs from one decade are compared with HEPs of other decades to verify that they are indeed of a significantly different character such that it justifies their different quantification. This tabular comparison and the resulting insights provide an additional reasonableness check as requested by the PRA Peer Review Team. As reasonableness checks for HFE failure rates have been completed and are documented in the HRA notebook, this SR meets Capability Category II.

Enclosure 3 to
NRC-14-0065

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

Marked-up Pages of Existing Fermi 2 TS

Insert 1

In accordance with the Surveillance Frequency Control Program

Insert 3

5.5.15 Surveillance Frequency Control Program

This program provides controls for the 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 the 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.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify core reactivity difference between the monitored reactivity and the predicted reactivity is within ± 1% Δk/k.	Once within 24 hours after reaching equilibrium conditions following startup after fuel movement within the reactor pressure vessel AND ~~1000 MWD/ST thereafter during operations in MODE 1~~

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE Insert 1	FREQUENCY
SR 3.1.3.1	Determine the position of each control rod.	~~24 hours~~
SR 3.1.3.2	----------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 1 ---------- Insert each withdrawn control rod at least one notch.	~~31 days~~
SR 3.1.3.3	Verify each control rod scram time from fully withdrawn to notch position 06 is ≤ 7 seconds.	In accordance with SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4
SR 3.1.3.4	Verify each control rod does not go to the withdrawn overtravel position.	Each time the control rod is withdrawn to "full out" position <u>AND</u> Prior to declaring control rod OPERABLE after work on control rod or CRD System that could affect coupling

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.	~~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 associated core cell AND Prior to exceeding 40% RTP after work on control rod or CRD System that could affect scram time

Insert 1

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 pressure is ≥ 940 psig.	~~7 days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Nine or more OPERABLE control rods not in compliance with the prescribed withdrawal sequence.	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 the prescribed withdrawal sequence.	~~24 hours~~

Insert 1

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. Insert 1	~~24 hours~~ Insert 1
SR 3.1.7.2	Verify temperature of sodium pentaborate solution is ≥ 48°F. Insert 1	~~24 hours~~ Insert 1
SR 3.1.7.3	Verify temperature of pump suction piping is ≥ 48°F. Insert 1	~~24 hours~~ Insert 1
SR 3.1.7.4	Verify continuity of explosive charge. Insert 1	~~31 days~~ Insert 1
SR 3.1.7.5	Verify the concentration of boron in solution is within the limits of Figure 3.1.7-1.	~~31 days~~ AND Once within 24 hours after water or boron is added to solution AND Once within 24 hours after solution temperature is restored ≥ 48°F

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.7.6	Verify each SLC subsystem manual 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~~
SR 3.1.7.7	Verify each pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1215 psig.	In accordance with the Inservice Testing Program
SR 3.1.7.8	Verify flow through one SLC subsystem from pump into reactor pressure vessel.	~~18 months on a STAGGERED TEST BASIS~~
SR 3.1.7.9	Verify all piping between storage tank and explosive valve is unblocked.	~~18 months~~ AND Once within 24 hours after solution temperature is restored ≥ 48°F
SR 3.1.7.10	Verify sodium pentaborate enrichment is ≥ 65 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 intermittently for testing under administrative control. Insert 1 ---------- Verify each SDV vent and drain valve is open. Insert 1	~~31 days~~
SR 3.1.8.2	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.	~~18 months~~

3.2 POWER DISTRIBUTION LIMITS

3.2.1 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

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

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ 25% RTP AND ~~24 hours thereafter~~
SR 3.2.2.2	Determine the MCPR limits.	Once within 72 hours after each completion of SR 3.1.4.1 AND Once within 72 hours after each completion of SR 3.1.4.2 AND Once within 72 hours after each completion of SR 3.1.4.4

Insert 1

3.2 POWER DISTRIBUTION LIMITS

3.2.3 LINEAR HEAT GENERATION RATE (LHGR)

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

APPLICABILITY: THERMAL POWER ≥ 25% RTP.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify all LHGRs are less than or equal to the limits specified in the COLR. Insert 1	Once within 12 hours after ≥ 25% RTP AND ~~24 hours thereafter~~

SURVEILLANCE REQUIREMENTS

NOTES

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

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

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.1.1.2	Perform CHANNEL CHECK.	~~24 hours~~ Insert 1
SR 3.3.1.1.3	NOTE Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. Insert 1 Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP, while operating at ≥ 25% RTP.	~~7 days~~ Insert 1
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. Insert 1 Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~ Insert 1
SR 3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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. Insert 1 ---------- Verify the IRM and APRM channels overlap. Insert 1	~~7 days~~
SR 3.3.1.1.8	Calibrate the local power range monitors. Insert 1	~~1000 MWD/T average core exposure~~
SR 3.3.1.1.9	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~92 days~~
SR 3.3.1.1.10	Verify the trip unit setpoint.	~~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. Insert 1 ---------- Perform CHANNEL CALIBRATION.	~~184 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.12	----------NOTE---------- For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. Insert 1 ---------- Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
	Insert 1	
SR 3.3.1.1.13	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~
	Insert 1	
SR 3.3.1.1.14	Perform CHANNEL CALIBRATION.	~~18 months~~
	Insert 1	
SR 3.3.1.1.15	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~18 months~~
	Insert 1	
SR 3.3.1.1.16	Verify Turbine Stop Valve-Closure and Turbine Control Valve Fast Closure Functions are not bypassed when THERMAL POWER is ≥ 29.5% RTP.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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.~~ ---------- Insert 1 Verify the RPS RESPONSE TIME is within limits.	~~18 months on a STAGGERED TEST BASIS~~
SR 3.3.1.1.18	Insert 1 ----------NOTE---------- Neutron detectors are excluded. ---------- Perform CHANNEL CALIBRATION. Insert 1	~~24 months~~
SR 3.3.1.1.19	Perform LOGIC SYSTEM FUNCTIONAL TEST. Insert 1	~~24 months~~
SR 3.3.1.1.20	Verify OPRM is not bypassed when APRM Simulated Thermal Power is ≥ 27.5% and recirculation drive flow is < 60% of rated recirculation drive flow.	~~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.	~~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.	~~12 hours~~
SR 3.3.1.2.3	Perform CHANNEL CHECK.	~~24 hours~~

Insert 1

Insert 1

Insert 1

(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; or b. ≥ 0.7 cps when signal-to-noise ratio is ≥ 20:1.	Insert 1 ~~12 hours during CORE ALTERATIONS~~ AND ~~24 hours~~
SR 3.3.1.2.5	----------NOTE---------- Signal-to-noise ratio not required to be determined when SRM count rate is ≥ 3.0 cps ---------- Perform CHANNEL FUNCTIONAL TEST and determination of signal-to-noise ratio.	Insert 1 ~~7 days~~
SR 3.3.1.2.6	----------NOTES---------- 1. Signal-to-noise ratio not required to be determined when SRM count rate is ≥ 3.0 cps 2. 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.	Insert 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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. ---------- Insert 1 --- Perform CHANNEL CALIBRATION.	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One or more Reactor Mode Switch - Shutdown Position channels inoperable.	E.1 Suspend control rod withdrawal.	Immediately
	AND	
	E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

----------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	----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. Insert 1 ----------	
	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.2	----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. Insert 1 ---------- Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
	Insert 1	
SR 3.3.2.1.3	Perform CHANNEL FUNCTIONAL TEST.	~~184 days~~
SR 3.3.2.1.4	----------NOTE---------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. Insert 1 ---------- Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~
	Insert 1	
SR 3.3.2.1.5	Verify the RBM is not bypassed when THERMAL POWER is ≥ 30% RTP.	~~24 months~~
SR 3.3.2.1.6	----------NOTE---------- Neutron detectors are excluded. ----------Insert 1---- Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.2.1.7	Verify control rod sequences input to the RWM are in conformance with the prescribed withdrawal sequence.	Prior to declaring RWM OPERABLE following loading of sequence into RWM

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.2.2.1	Perform CHANNEL CHECK. Insert 1	~~12 hours~~
SR 3.3.2.2.2	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~31 days~~
SR 3.3.2.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 219 inches. Insert 1	~~18 months~~
SR 3.3.2.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation. Insert 1	~~18 months~~

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.3.1.1	Perform CHANNEL CHECK.	~~31 days~~
SR 3.3.3.1.2	Perform CHANNEL CALIBRATION.	~~18 months~~

Insert 1

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.2.1	Perform CHANNEL CHECK for each required instrumentation channel. Insert 1	~~31 days~~ Insert 1
SR 3.3.3.2.2	Verify each required control circuit and transfer switch is capable of performing the intended function. Insert 1	~~18 months~~ Insert 1
SR 3.3.3.2.3	Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~18 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 2 hours provided the associated Function maintains ATWS-RPT trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL CHECK. Insert 1	~~12 hours~~ Insert 1
SR 3.3.4.1.2	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~31 days~~ Insert 1
SR 3.3.4.1.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level – Low Low, Level 2: ≥ 103.8 inches; and b. Reactor Vessel Pressure – High: ≤ 1153 psig. Insert 1	~~18 months~~ Insert 1
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	~~18 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 Function 3.c; and (b) for up to 6 hours for Functions other than 3.c and 3.f provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK. Insert 1	~~12 hours~~ Insert 1
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~92 days~~ Insert 1
SR 3.3.5.1.3	Verify the trip unit setpoint. Insert 1	~~92 days~~ Insert 1
SR 3.3.5.1.4	Perform CHANNEL CALIBRATION. Insert 1	~~18 months~~ Insert 1
SR 3.3.5.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST. Insert 1	~~18 months~~ Insert 1
SR 3.3.5.1.6	Perform CHANNEL FUNCTIONAL TEST.	~~18 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 Function 2; and (b) for up to 6 hours for Functions 1 and 3 provided the associated Function maintains RCIC initiation capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.5.2.1	Perform CHANNEL CHECK. Insert 1	~~12 hours~~ Insert 1
SR 3.3.5.2.2	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~92 days~~ Insert 1
SR 3.3.5.2.3	Verify the trip unit setpoint. Insert 1	~~92 days~~ Insert 1
SR 3.3.5.2.4	Perform CHANNEL CALIBRATION. Insert 1	~~18 months~~ Insert 1
SR 3.3.5.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST. Insert 1	~~18 months~~ Insert 1
SR 3.3.5.2.6	Perform CHANNEL FUNCTIONAL TEST.	~~18 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:

   a. 2 hours for Function 5.a when testing non-redundant circuitry that results in loss of isolation capability associated with this Function, provided Functions 5.b, 5.c, and 5.e are OPERABLE;

   b. 6 hours for Function 5 (other than non-redundant circuitry of 5.a) provided the associated Function maintains isolation capability. 6 hours for Function 5.c provided Function 5.b is OPERABLE in the affected room;

   c. 6 hours for Functions 1, 2, 6, and 7, provided the associated Function maintains isolation capability; and

   d. 8 hours for Functions 3 and 4, provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK. Insert 1	~~12 hours~~
SR 3.3.6.1.2	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~92 days~~
SR 3.3.6.1.3	Verify the trip unit setpoint. Insert 1	~~92 days~~
SR 3.3.6.1.4	Perform CHANNEL CALIBRATION. Insert 1	~~18 months~~
SR 3.3.6.1.5	Perform LOGIC SYSTEM FUNCTIONAL TEST. Insert 1	~~18 months~~
SR 3.3.6.1.6	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.7	Verify the Main Steam Line Isolation Instrumentation DC Output Relays response time allows the overall ISOLATION SYSTEM RESPONSE TIME to remain within limits.	~~18 months on a STAGGERED TEST BASIS~~

Insert 1

Correction letter of 11-27-2002

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. Insert 1	~~12 hours~~
SR 3.3.6.2.2	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~92 days~~
SR 3.3.6.2.3	Verify the trip unit setpoint. Insert 1	~~92 days~~
SR 3.3.6.2.4	Perform CHANNEL CALIBRATION. Insert 1	~~18 months~~
SR 3.3.6.2.5	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~18 months~~

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.6.3.1	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~31 days~~ Insert 1
SR 3.3.6.3.2	Perform CHANNEL FUNCTIONAL TEST for portion of the channel outside primary containment. Insert 1	~~31 days~~ Insert 1
SR 3.3.6.3.3	Perform CHANNEL CALIBRATION. Insert 1	~~18 months~~ Insert 1
SR 3.3.6.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~18 months~~

SURVEILLANCE REQUIREMENTS

NOTES

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

2. For Functions 1, 2, and 3, 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 CREF initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.7.1.2	Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~
SR 3.3.7.1.3	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.7.1.4	Verify the trip unit setpoint.	~~92 days~~
SR 3.3.7.1.5	Perform CHANNEL CALIBRATION.	~~18 months~~
SR 3.3.7.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~18 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

NOTE

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

SURVEILLANCE		FREQUENCY
SR 3.3.8.1.1	Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~31 days~~
SR 3.3.8.1.2	Perform CHANNEL CALIBRATION. Insert 1	~~18 months~~
SR 3.3.8.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST. Insert 1	~~18 months~~

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. Insert 1 ---------- Perform CHANNEL FUNCTIONAL TEST. Insert 1	~~184 days~~
SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ 132 V. b. Undervoltage ≥ 108 V. c. Underfrequency ≥ 57 Hz. Insert 1	~~18 months~~
SR 3.3.8.2.3	Perform a system functional test.	~~18 months~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Recirculation jet pump loop flow mismatch not within limits.	A.1 Declare recirculation loop with lower flow: "not in operation."	2 hours
B. No recirculation loops operating.	B.1 Be in MODE 3.	12 hours

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. Insert 1 ----------	
	Verify recirculation loop jet pump flow mismatch with both recirculation loops in operation is: a. ≤ 10% of rated core flow when operating at < 70% of rated core flow; and b. ≤ 5% of rated core flow when operating at ≥ 70% of rated core flow.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	----------NOTES---------- 1. Not required to be performed until 4 hours after associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > 25% RTP. Insert 1 ---------- 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.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift setpoints of the required SRVs are as follows: Number of SRVs — Setpoint (psig) 5 — 1135 ± 34.05 5 — 1145 ± 34.35 5 — 1155 ± 34.65 Following testing, lift settings shall be within ± 1%. Insert 1	In accordance with the Inservice Testing Program
SR 3.4.3.2	Verify each required SRV is capable of being opened.	~~18 months~~

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	~~8 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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. All required leakage detection systems inoperable.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Perform a CHANNEL CHECK of required primary containment atmosphere gaseous radioactivity monitoring system. Insert 1	~~12 hours~~
SR 3.4.6.2	Perform a CHANNEL FUNCTIONAL TEST of required leakage detection instrumentation. Insert 1	~~31 days~~
SR 3.4.6.3	Perform a CHANNEL CALIBRATION of required leakage detection instrumentation. Insert 1	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR Reactor coolant specific activity > 4.0 μCi/gm DOSE EQUIVALENT I-131.	B.1 Determine DOSE EQUIVALENT I-131. AND B.2.1 Isolate all main steam lines. OR B.2.2.1 Be in MODE 3. AND B.2.2.2 Be in MODE 4.	Once per 4 hours 12 hours 12 hours 36 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	----------NOTE---------- Not required to be met until 4 hours after reactor steam dome pressure is less than the RHR cut in permissive pressure. ---------- Insert 1 ---- Verify one RHR shutdown cooling subsystem or recirculation pump is operating.	~~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	Initiate action to restore one RHR shutdown cooling subsystem or one recirculation pump to operation.	Immediately
	AND		
	B.2	Verify reactor coolant circulating by an alternate method.	1 hour from discovery of no reactor coolant circulation
	AND		
	B.3	Monitor reactor coolant temperature.	Once per hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		Insert 1	FREQUENCY
SR 3.4.9.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating.		~~12 hours~~

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	----------NOTE---------- Only required to be performed as applicable during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---------- Insert 1	
	Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.	~~30 minutes~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.10.7	----------NOTE---------- Only required to be performed when tensioning the reactor vessel head bolting studs. ---------- Insert 1 ---------- Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR when the reactor vessel head bolt studs are under tension.	~~30 minutes~~
SR 3.4.10.8	----------NOTE---------- Not required to be performed until 30 minutes after RCS temperature ≤ 80°F in MODE 4. ---------- Insert 1 ---------- Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR.	~~30 minutes~~
SR 3.4.10.9	----------NOTE---------- Not required to be performed until 12 hours after RCS temperature ≤ 100°F in MODE 4. ---------- Insert 1 ---------- Verify reactor vessel flange and head flange temperatures are within the limits specified in the PTLR.	~~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 ≤ 1045 psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify reactor steam dome pressure is ≤ 1045 psig.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.1.1	Verify correct voltage and breaker alignment to the LPCI swing bus.	~~7 days~~
SR 3.5.1.2	----------NOTE---------- When LPCI is placed in an inoperable status solely for performance of this SR, or when the LPCI swing bus automatic throwover scheme is inoperable due to EDG-12 being paralleled to the bus for required testing, entry into associated Conditions and Required Actions may be delayed up to 12 hours for completion of the required testing. Insert 1 ----------	
	Perform a functional test of the LPCI swing bus automatic throwover scheme. Insert 1	~~31 days~~
SR 3.5.1.3	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.4	----------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, and for 4 hours after exceeding the RHR cut-in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. Insert 1 ---------- Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. Insert 1	~~31 days~~
SR 3.5.1.5	Verify primary containment pneumatic supply pressure is ≥ 75 psig. Insert 1	~~31 days~~
SR 3.5.1.6	Verify the RHR System power operated cross tie valve is open. Insert 1	~~31 days~~
SR 3.5.1.7	Verify each recirculation pump discharge valve cycles through one complete cycle of full travel or is de-energized in the closed position.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.8	Verify the following ECCS pumps develop 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 Core Spray: ≥ 5725 gpm, 2, ≥ 100 psig LPCI: ≥ 10,000 gpm, 1, ≥ 20 psig	In accordance with the Inservice Testing Program
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 ≤ 1045 and ≥ 945 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Inservice Testing Program
SR 3.5.1.10	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Insert 1 ---------- Verify, with reactor pressure ≤ 215 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.11	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Insert 1 ---- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	~~18~~ ~~months~~
SR 3.5.1.12	----------NOTE---------- Valve actuation may be excluded. ---------- Insert 1 ----- Verify the ADS actuates on an actual or simulated automatic initiation signal. Insert 1	~~18~~ ~~months~~
SR 3.5.1.13	Verify each ADS valve is capable of being opened.	~~18~~ ~~months~~
SR 3.5.1.14	----------NOTE---------- ECCS instrumentation response times are not required to be measured. Insert 1 ---------- Verify ECCS RESPONSE TIME is within limits.	~~18~~ ~~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		Insert 1	FREQUENCY
SR 3.5.2.1	Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ -66 inches.		~~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 ≥ -66 inches; or b. ----------NOTE---------- Only one required CS subsystem may take credit for this option during OPDRVs. ---------- Condensate storage tank water level is ≥ 19 ft. Insert 1	~~12 hours~~
SR 3.5.2.3	Verify correct voltage and breaker alignment to the LPCI swing bus. Insert 1	~~7 days~~
SR 3.5.2.4	Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	----------NOTE---------- LPCI subsystem(s) may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. Insert 1 ---------- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.2.6	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 / ≥ 5725 gpm / 2 / ≥ 100 psig LPCI / ≥ 10,000 gpm / 1 / ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.2.7	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Insert 1 ---- Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	~~18 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. Insert 1	~~31 days~~ Insert 1
SR 3.5.3.2	Verify each RCIC System manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.3.3	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Insert 1 ---------- Verify, with reactor pressure ≤ 1045 psig and ≥ 945 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~92 days~~
SR 3.5.3.4	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Insert 1 ---------- Verify, with reactor pressure ≤ 200 psig, the RCIC pump can develop a flow rate ≥ 600 gpm against a system head corresponding to reactor pressure.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.5	----------NOTE---------- Vessel injection may be excluded. ----------Insert 1---- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.2	Verify drywell to suppression chamber differential pressure does not decrease at a rate > 0.2 inch water gauge per minute tested over a 10 minute period at an initial differential pressure of 1 psid.	~~18 months~~ Insert 1 AND ------NOTE----- Only required after two consecutive tests fail and continues until two consecutive tests pass ---------- 9 months
SR 3.6.1.1.3	----------NOTE---------- Only required to be performed after safety/relief valve operation with the suppression chamber average water temperature ≥ 160°F and reactor coolant system pressure > 200 psig. ---------- Perform an external visual examination of the suppression chamber.	Once prior to entry into MODE 2 or 3 from MODE 4

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 applicable 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. Insert 1	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	----------NOTE---------- Not required to be met when the isolation valves for one purge or containment pressure control supply line and one purge or containment pressure control exhaust line 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. Insert 1 ---------- Verify each drywell and suppression chamber purge system and containment pressure control isolation valve is closed.	~~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. Insert 1 ---------- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	~~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 isolation manual valve and blind flange that is located inside primary containment and is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if 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 of the traversing incore probe (TIP) shear isolation valve explosive charge.	Insert 1 ~~31 days~~
SR 3.6.1.3.5	Verify the isolation time of each power operated 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	Perform leakage rate testing for each primary containment purge valve with resilient seals.	~~184 days~~ AND Once within 92 days after opening the valve
SR 3.6.1.3.7	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.6.1.3.8	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	~~18 months~~
SR 3.6.1.3.9	Verify a representative sample of reactor instrumentation line EFCVs actuates on a simulated instrument line break to restrict flow.	~~18 months~~
SR 3.6.1.3.10	Remove and test the explosive squib from each shear isolation valve of the TIP System.	~~18 months on a STAGGERED TEST BASIS~~

Insert 1

Insert 1

Insert 1

Insert 1

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.4 Primary Containment Pressure

LCO 3.6.1.4 Primary containment pressure shall be ≥ -0.10 psig and ≤ +2.0 psig.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Primary containment pressure not within limit.	A.1 Restore primary 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 primary containment pressure is within limit.	~~12 hours~~

Insert 1

3.6 CONTAINMENT SYSTEMS

3.6.1.5 Drywell Air Temperature

LCO 3.6.1.5 Drywell average air temperature shall be ≤ 145°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.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		Insert 1	FREQUENCY
SR 3.6.1.5.1	Verify drywell average air temperature is within limit.		~~24 hours~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.6.1	Verify each LLS valve is capable of being opened.	~~18 months~~
SR 3.6.1.6.2	----------NOTE---------- Valve actuation may be excluded. ---------- Insert 1 ---------- Verify the LLS System actuates on an actual or simulated automatic initiation signal.	~~18 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.7.1	----------NOTES---------- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. Insert 1 ---------- Verify each vacuum breaker is closed. Insert 1	~~14 days~~
SR 3.6.1.7.2	Perform a functional test of each vacuum breaker. Insert 1	~~31 days~~
SR 3.6.1.7.3	Verify the opening setpoint of each vacuum breaker is ≤ 0.5 psid.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.8.1	----------NOTES---------- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. Insert 1 ---------- Verify each vacuum breaker is closed.	~~7 days~~
SR 3.6.1.8.2	Perform a functional test of each vacuum breaker.	Prior to entering MODE 2 or 3 from MODE 4 if not performed in the previous 92 days AND Within 12 hours after any discharge of steam to the suppression chamber from the SRVs
SR 3.6.1.8.3	Verify the opening setpoint of each vacuum breaker is ≤ 0.5 psid. Insert 1	~~18 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
	AND	
	E.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

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

Insert 1

3.6 CONTAINMENT SYSTEMS

3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be ≥ −2 inches and ≤ +2 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.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.2.1	Verify suppression pool water level is within limits.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~
SR 3.6.2.3.2	Verify each required RHR pump develops a flow rate ≥ 9,250 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the Inservice Testing Program

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	~~31 days~~ Insert 1
SR 3.6.2.4.2	Verify each RHR pump develops a flow rate ≥ 500 gpm through the heat exchanger and suppression pool spray sparger while operating in the suppression pool spray mode.	In accordance with the Inservice Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.3.1 Primary Containment Oxygen Concentration

LCO 3.6.3.1 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 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 3.6.3.1.1	Verify primary containment oxygen concentration is within limits.	~~7 days~~

Insert 1

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify secondary containment vacuum is ≥ 0.125 inch of vacuum water gauge.	~~24 hours~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.2	----------NOTE---------- Not required to be met for one railroad bay access door until: a. 4 hours after opening for entry, exit, or testing; and b. 12 hours after opening for new fuel receipt activities provided the other door remains OPERABLE and closed. ----------Insert 1------ Verify all secondary containment equipment hatches, pressure relief doors and railroad bay access doors are closed and sealed. Insert 1	~~31 days~~
SR 3.6.4.1.3	Verify one secondary containment access door in each access opening is closed.	~~31 days~~
SR 3.6.4.1.4	Verify steam tunnel blowout panels are closed. Insert 1	Prior to entering MODE 2 or 3 from MODE 4 if not performed in the previous 31 days
SR 3.6.4.1.5	Verify each standby gas treatment (SGT) subsystem will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in ≤ 12 minutes. Insert 1	~~18 months on a STAGGERED TEST BASIS~~
SR 3.6.4.1.6	Verify each SGT subsystem can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment for 1 hour at a flow rate ≤ 3000 cfm.	~~18 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. Insert 1 ---------- Verify each secondary containment isolation manual valve and blind flange not locked, sealed, or otherwise secured that is required to be closed during accident conditions is closed.	~~31 days~~
SR 3.6.4.2.2	Verify the isolation time of each power operated automatic SCIV is within limits.	In accordance with the Inservice Testing Program
SR 3.6.4.2.3	Insert 1 Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ 15 continuous minutes with heaters operating.	~~31 days~~
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	~~18 months~~
SR 3.6.4.3.4	Verify each SGT filter cooler bypass damper can be opened and the fan started.	~~18 months~~

Insert 1

Insert 1

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 ·····NOTE····· LCO 3.0.4.a is not applicable when entering MODE 3. ····· Be in MODE 3.	12 hours
E. Both RHRSW subsystems inoperable for reasons other than Condition B.	E.1 ·····NOTE····· Enter applicable Conditions and Required Actions of LCO 3.4.8 for RHR shutdown cooling made inoperable by RHRSW System. ····· Restore one RHRSW subsystem to OPERABLE status.	8 hours
F. Required Action and associated Completion Time of Condition E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

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

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met. OR Both EECW/EESW subsystems inoperable for reasons other than Condition A. OR UHS inoperable for reasons other than Conditions 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	Verify the water level of each UHS reservoir, and the average water level of each of the two reservoirs, are ≥ 25 ft. Insert 1	~~24 hours~~ Insert 1
SR 3.7.2.2	Verify the average water temperature of each reservoir, and combined average water temperature of the two reservoirs, are ≤ 80°F.	~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.2.3	----------NOTE---------- Fast speed testing not required to be performed during icing periods. Insert 1 ---------- Operate each cooling tower fan on slow speed and on fast speed, each for ≥ 15 minutes.	~~31 days~~
SR 3.7.2.4	----------NOTE---------- Isolation of EECW flow to individual components does not render EECW System inoperable. Insert 1 ---------- Verify each EECW/EESW subsystem and UHS 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. Insert 1	~~31 days~~
SR 3.7.2.5	Verify each EECW/EESW subsystem actuates on an actual or simulated initiation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.3.1	Operate each CREF subsystem for ≥ 15 continuous minutes with heaters operating.	~~31 days~~
SR 3.7.3.2	----------NOTE---------- When the CREF system is made inoperable in MODE 1, 2, or 3 solely for VFTP required surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours. ---------- Perform required CREF filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.3.3	Verify each CREF subsystem actuates on an actual or simulated initiation signal.	~~18 months~~
SR 3.7.3.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

Insert 1

Insert 1

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify the control room air temperature is ≤ 95°F.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	----------NOTE---------- Not required to be performed until 31 days after any main steam line not isolated and SJAE in operation. Insert 1 ---------- Verify the gross radioactivity rate of the noble gases is ≤ 340 mCi/second after decay of 30 minutes.	~~31 days~~
SR 3.7.5.2	Verify the gross radioactivity rate of the noble gases is ≤ 340 mCi/second after decay of 30 minutes.	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 each main turbine bypass valve opens at least 5%.	~~120 days~~
SR 3.7.6.2	Verify one complete cycle of each main turbine bypass valve.	Once after each entry into MODE 4
SR 3.7.6.3	Perform a system functional test.	~~18 months~~
SR 3.7.6.4	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	~~18 months~~

Insert 1

Insert 1

Insert 1

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.	~~7 days~~

Insert 1

3.7 PLANT SYSTEMS

3.7.8 Emergency Diesel Generator Service Water (EDGSW) System

LCO 3.7.8 Four EDGSW subsystems shall be OPERABLE.

APPLICABILITY: When associated EDG is required to be OPERABLE.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more EDGSW subsystems inoperable.	A.1 Declare associated EDG(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify each EDGSW 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. Insert 1	Insert 1 ~~31 days~~
SR 3.7.8.2	Verify each EDGSW subsystem pump starts automatically when the associated EDG starts.	~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	~~7 days~~
SR 3.8.1.2	----------NOTES---------- 1. All EDG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. A modified EDG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. ---------- Insert 1 ---- Verify each EDG starts and achieves steady state voltage ≥ 3950 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~31 days~~
SR 3.8.1.3	----------NOTES---------- 1. EDG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients below the load limit do not invalidate this test. 3. This Surveillance shall be conducted on only one EDG at a time. ---------- Insert 1 ---- Verify each EDG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2500 kW.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.4	Verify each day tank contains ≥ one hour supply of fuel oil. Insert 1	~~31 days~~ Insert 1
SR 3.8.1.5	Check for and remove accumulated water from each day tank. Insert 1	~~31 days~~ Insert 1
SR 3.8.1.6	Verify each fuel oil transfer system operates to automatically transfer fuel oil from storage tanks to the day tanks.	~~31 days~~
SR 3.8.1.7	----------NOTE---------- All EDG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. Insert 1 ---------- Verify each EDG starts from standby condition and achieves: a. In ≤ 10 seconds, voltage ≥ 3950 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. Insert 1	~~184 days~~
SR 3.8.1.8	Verify each EDG rejects a load greater than or equal to its associated single largest post-accident load, and following load rejection, the frequency is ≤ 66.75 Hz.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	Verify each EDG does not trip and voltage is maintained ≤ 5267 V during and following a load rejection of ≥ 2850 kW.	~~18 months~~ Insert 1
SR 3.8.1.10	----------NOTE---------- All EDG starts may be preceded by an engine prelube period. Insert 1 ---------- Verify on simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. EDG auto-starts and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through load sequencer, 3. maintains steady state voltage ≥ 3950 V and ≤ 4580 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	~~18 months~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTE---------- All EDG starts may be preceded by an engine prelube period. Insert 1 ---------- Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each EDG auto-starts and: a. In ≤ 10 seconds after auto-start and during tests, achieves voltage ≥ 3950 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 ~~Hz; and~~ c. Operates for ≥ 5 minutes. Insert 1	~~18 months~~
SR 3.8.1.12	Verify each EDG's automatic trips are bypassed on an actual or simulated emergency start signal except: a. Engine overspeed; b. Generator differential current; c. Low lube oil pressure; d. Crankcase overpressure; and e. Failure to start.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTE---------- Momentary transients outside the load range do not invalidate this test. Insert 1 ----------	
	Verify each EDG operates for ≥ 24 hours: a. For all but the final ≥ 2 hours loaded ≥ 2500 kW and ≤ 2600 kW; and b. For the final ≥ 2 hours of the test loaded ≥ 2800 kW and ≤ 2900 kW.	~~18 months~~
SR 3.8.1.14	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the EDG after the EDG has operated ≥ 2 hours loaded ≥ 2500 kW or until operating temperatures have stabilized. Momentary transients below the load limit do not invalidate this test. 2. All EDG starts may be preceded by an engine prelube period. Insert 1 ----------	
	Verify each EDG starts and achieves: a. In ≤ 10 seconds, voltage ≥ 3950 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3950 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	Verify each EDG: Insert 1 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 standby status. Insert 1	~~18 months~~
SR 3.8.1.16	Verify interval between each sequenced load block is within ± 10% of design interval for each load sequencer timer.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTE---------- All EDG starts may be preceded by an engine prelube period. ---------- Insert 1 ---------- Verify, on simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. EDG auto-starts and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 3950 V and ≤ 4580 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~18 months~~
SR 3.8.1.18	----------NOTE---------- All EDG starts may be preceded by an engine prelube period. ---------- Insert 1 ---------- Verify, when started simultaneously each EDG achieves, in ≤ 10 seconds, frequency ≥ 58.8 Hz.	~~10 years~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met. OR One or more required EDGs with diesel fuel oil, or starting air subsystem not within limits for reasons other than Condition A, B, or C.	D.1 Declare associated EDG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each required EDG fuel oil storage tank contains ≥ a 7 day supply of fuel.	~~31 days~~
SR 3.8.3.2	Verify each required EDG fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Emergency Diesel Generator Fuel Oil Testing Program.	In accordance with the Emergency Diesel Generator Fuel Oil Testing Program

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.3.3	Verify each required EDG air start receiver pressure is ≥ 215 psig. Insert 1	~~31 days~~
SR 3.8.3.4	Check for and remove accumulated water from each required EDG fuel oil storage tank. Insert 1	~~31 days~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 125.7 V on float charge. Insert 1	~~7 days~~ Insert 1
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify each battery cell-to-cell and terminal connection resistance is ≤ 1.5E-4 ohm. Insert 1	~~92 days~~ Insert 1
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance. Insert 1	~~18 months~~ Insert 1
SR 3.8.4.4	Remove visible corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material. Insert 1	~~18 months~~ Insert 1
SR 3.8.4.5	Verify each battery cell-to-cell and terminal connection resistance is ≤ 1.5E-4 ohm. Insert 1	~~18 months~~ Insert 1
SR 3.8.4.6	Verify each required battery charger supplies ≥ 100 amps at ≥ 124.7 V for ≥ 4 hours.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.7	----------NOTE---------- The performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7 ~~once per 60 months~~. Insert 1 ---------- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the actual or simulated emergency loads for the design duty cycle when subjected to a battery service test.	~~18 months~~
SR 3.8.4.8	----------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. Insert 1 ---------- Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test.	~~60 months~~ AND 18 months when battery shows degradation or has reached 85% of expected life

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells not within limits. OR One or more batteries with one or more battery cell parameters not within Table 3.8.6-1 Category C values.	B.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	~~7 days~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	~~92 days~~ AND Once within 24 hours after battery discharge < 105 V AND Once within 24 hours after battery overcharge > 145 V
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is > 60°F.	~~92 days~~

Insert 1

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more required DC electrical power distribution subsystems inoperable.	B.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 ---------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours
D. Two or more required electrical power distribution subsystems inoperable that result in a loss of function.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct breaker alignments and voltage to required AC and DC electrical power distribution subsystems.	~~7 days~~

Insert 1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	AND	
	A.2.4 Initiate actions to restore required AC and DC electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	
	A.2.5 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and voltage to required AC and DC electrical power distribution subsystems.	~~7 days~~

Insert 1

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 fuel grapple not fully retracted position, e. Refuel platform frame mounted hoist, fuel loaded, and f. Refuel platform monorail mounted hoist, fuel loaded.	Insert 1 ~~7 days~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.2.1	Verify reactor mode switch locked in Refuel position.	~~12 hours~~
SR 3.9.2.2	----------NOTE---------- Not required to be performed until 1 hour after any control rod is withdrawn. ---------- Insert 1 ---- Perform CHANNEL FUNCTIONAL TEST.	~~7 days~~

Insert 1

3.9 REFUELING OPERATIONS

3.9.3 Control Rod Position

LCO 3.9.3 All control rods shall be fully inserted.

APPLICABILITY: When loading fuel assemblies into the core.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify all control rods are fully inserted.	~~12 hours~~

Insert 1

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 1 Insert each withdrawn control rod at least one notch. Insert 1	~~7 days~~
SR 3.9.5.2	Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig.	~~7 days~~

3.9 REFUELING OPERATIONS

3.9.6 Reactor Pressure Vessel (RPV) Water Level

LCO 3.9.6 RPV water level shall be ≥ 20 ft 6 inches above the top of the RPV flange.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify RPV water level is ≥ 20 ft 6 inches above the top of the RPV flange.	~~24 hours~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	Suspend loading irradiated fuel assemblies into the RPV.	Immediately
	AND		
	B.2	Initiate action to restore secondary containment to OPERABLE status.	Immediately
	AND		
	B.3	Initiate action to restore one standby gas treatment subsystem to OPERABLE status.	Immediately
	AND		
	B.4	Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		Insert 1	FREQUENCY
SR 3.9.7.1	Verify the RHR shutdown cooling subsystem is capable of decay heat removal.		~~12 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.8.1	Verify one RHR shutdown cooling subsystem or recirculation pump is operating. Insert 1	~~12 hours~~ Insert 1
SR 3.9.8.2	Verify each RHR shutdown cooling subsystem is capable of decay heat removal.	~~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. Insert 1	~~12 hours~~
SR 3.10.2.2	Verify no CORE ALTERATIONS are in progress. Insert 1	~~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. ---------- Insert 1 -- 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. Insert 1	~~24 hours~~
SR 3.10.3.3	Verify all control rods, other than the control rod being withdrawn, are fully inserted.	~~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. ---------- Insert 1 --- Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed.	~~24 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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

Insert 1

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. Insert 1	~~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. Insert 1	~~24 hours~~
SR 3.10.5.3	Verify a control rod withdrawal block is inserted.	~~24 hours~~
SR 3.10.5.4	Perform SR 3.1.1.1. Insert 1	According to SR 3.1.1.1
SR 3.10.5.5	Verify no other CORE ALTERATIONS are in progress.	~~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.	Immediately
	OR	
	A.3.2 Initiate action to satisfy the requirements of this LCO.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.6.1	Verify the four fuel assemblies are removed from core cells associated with each control rod or CRD removed. Insert 1	~~24 hours~~ Insert 1
SR 3.10.6.2	Verify all other control rods in core cells containing one or more fuel assemblies are fully inserted.	~~24 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.7.1	Perform the MODE 2 applicable SRs for LCO 3.3.1.1, Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1.	According to the applicable SRs
SR 3.10.7.2	----------NOTE---------- Not required to be met if SR 3.10.7.3 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 3.10.7.3	----------NOTE---------- Not required to be met if SR 3.10.7.2 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. Insert 1	During control rod movement
SR 3.10.7.4	Verify no other CORE ALTERATIONS are in progress.	~~12 hours~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.7.5	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 3.10.7.c requirement after work on control rod or CRD System that could affect coupling
SR 3.10.7.6	Verify CRD charging water header pressure ≥ 940 psig.	~~7 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.8.1	Verify penetration X26 outboard isolation valves T4800F407 and T4800F408 are closed and deactivated. Insert 1	------NOTE----- SR 3.0.2 is not applicable. ---------- ~~31 days~~
SR 3.10.8.2	----------NOTE---------- Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. ----------	
	Perform leakage rate testing for primary containment purge valves with resilient seals on penetration X26. Insert 1	------NOTE----- SR 3.0.2 is not applicable. ---------- ~~45 days~~

5.5 Programs and Manuals

5.5.14 Control Room Envelope Habitability Program (continued)

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one subsystem of the CREF System, operating at the flow rate required by the VFTP, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and assessed every 18 months.

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.

Insert 3

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.

Enclosure 4 to
NRC-14-0065

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

Marked-up Pages of Existing Fermi 2 TS Bases (For Information Only)

Insert 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Verifying the reactivity difference between the monitored and predicted reactivity is within the limits of the LCO provides added assurance that plant operation is maintained within the assumptions of the DBA and transient analyses. A comparison of the monitored reactivity to the predicted reactivity at the same cycle exposure is used to calculate the reactivity difference. The comparison is required when the core reactivity has potentially changed by a significant amount. This may occur following a refueling in which new fuel assemblies are loaded, fuel assemblies are shuffled within the core, or fuel assemblies are removed and reinserted as when control rods are replaced or shuffled. Also, core reactivity changes during the cycle. The 24 hour interval after reaching equilibrium conditions following a startup is based on the need for equilibrium xenon concentrations in the core, such that an accurate comparison between the monitored and predicted reactivity can be made. For the purposes of this SR, the reactor is assumed to be at equilibrium conditions when steady state operations (no control rod movement or core flow changes) at ≥ 80% RTP have been obtained. ~~The 1000 MWD/ST Frequency was developed, considering the relatively slow change in core reactivity with exposure and operating experience related to variations in core reactivity.~~ This comparison requires the core to be operating at power levels which minimize the uncertainties and measurement errors, in order to obtain meaningful results. Therefore, the comparison is only done when in MODE 1. Insert 2

REFERENCES

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

BASES

ACTIONS (continued)

Condition D is modified by a Note indicating that the Condition is not applicable when > 10% RTP, since the prescribed withdrawal sequence is not required to be followed under these conditions, as described in the Bases for LCO 3.1.6. The allowed Completion Time of 4 hours is acceptable, considering the low probability of a CRDA occurring.

E.1

If any Required Action and associated Completion Time of Condition A, C, or D are not met, or there are nine or more inoperable control rods, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. This ensures all insertable control rods are inserted and places the reactor in a condition that does not require the active function (i.e., scram) of the control rods. The number of control rods permitted to be inoperable when operating above 10% RTP (e.g., no CRDA considerations) could be more than the value specified, but the occurrence of a large number of inoperable control rods could be indicative of a generic problem, and investigation and resolution of the potential problem should be undertaken. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

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

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.3.2

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 prescribed withdrawal sequence (LCO 3.1.6) and the RWM (LCO 3.3.2.1). ~~Partially withdrawn control rods are tested at a 31 day Frequency, based on the potential power reduction required to allow the control rod movement. Furthermore, the 31 day Frequency takes into account operating experience related to changes in CRD performance.~~ At any time, if a withdrawn control rod is immovable, a determination of that control rod's ability to insert on a scram (OPERABILITY) must be made and appropriate action taken.

Insert 2

SR 3.1.3.3

Verifying that the scram time for each control rod to notch position 06 is ≤ 7 seconds provides reasonable assurance that the control rod will insert when required during a DBA or transient, thereby completing its shutdown function. This SR is performed in conjunction with the control rod scram time testing of SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," that overlaps this Surveillance and the functional testing of SDV vent and drain valves in LCO 3.1.8, "Scram Discharge Volume (SDV) Vent and Drain Valves," provide complete testing of the assumed safety function. The associated Frequencies are acceptable, considering the more frequent testing performed to demonstrate other aspects of control rod OPERABILITY and operating experience, which shows scram times do not significantly change over an operating cycle.

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 (i.e., ≥ 19 control rods tested). The sample remains representative if no more than 7.5% of the control rods in the sample tested are determined to be "slow" or inoperable. With more than 7.5% of the sample declared to be "slow" or inoperable 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" and inoperable 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 and should be in addition to any scram time testing required to satisfy SR 3.1.4.4 following work on control rods or the CRD System that could affect scram times. Data from 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. If data is captured from a reactor scram, all rods are available for selection in the next required test 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."~~

Insert 2

SR 3.1.4.3

When work that could affect the scram insertion time is performed on a control rod or the CRD System, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod OPERABLE. The required scram time testing must demonstrate the affected control rod is still within acceptable limits. The limits for reactor pressures < 800 psig are established and maintained within approved plant procedures based on a high probability of meeting the acceptance criteria at reactor

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

periodically

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

Insert 2

REFERENCES

1. UFSAR, Section 4.5.2.2.3.
2. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1 periodically Insert 2

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

The RWM

REFERENCES

1. NEDE-24011-P-A-9-US, "General Electric Standard Application for Reactor Fuel, Supplement for United States," Section S.2.2.3.1, September 1988.

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. NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.

BASES

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 boron remains in solution and does not precipitate out in the storage tank or in the pump suction piping. ~~The 24 hour Frequency is based on operating experience and has shown there are relatively slow variations in the measured parameters of volume and temperature.~~

Insert 2

SR 3.1.7.4 and SR 3.1.7.6

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

Insert 2

SR 3.1.7.6 verifies that each manual 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 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 locally by a dedicated operator at the valve control. This is acceptable since the SLC System is a manually initiated system. This Surveillance also does not apply to valves that are locked, sealed, or otherwise secured in position since they are verified to be in the correct position prior to locking, sealing, or securing. This verification of valve alignment does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. ~~The 31 day Frequency is based on engineering judgment and is consistent~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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 boron exists in the storage tank. SR 3.1.7.5 must be performed anytime boron or water is added to the storage tank solution to determine that the boron solution concentration is within the specified limits. SR 3.1.7.5 must also be performed anytime the temperature is restored to ≥ 48°F to ensure that no significant boron precipitation occurred. ~~The 31 day Frequency of this Surveillance is appropriate because of the relatively slow variation of boron concentration between surveillances.~~

Insert 2

SR 3.1.7.7

Demonstrating that each SLC System pump develops a flow rate ≥ 41.2 gpm at a discharge pressure ≥ 1215 psig ensures that pump performance has not degraded during the fuel cycle. This minimum pump flow rate requirement ensures that, when combined with the sodium pentaborate solution concentration requirements, the rate of negative reactivity insertion from the SLC System will adequately compensate for the positive reactivity effects encountered during power reduction, cooldown of the moderator, and xenon decay. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this Surveillance is in accordance with the Inservice Testing Program.

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~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~tested every 36 months at alternating 18 month intervals.~~ The Surveillance may be performed in separate steps to prevent injecting boron into the RPV. An acceptable method for verifying flow from the pump to the RPV is to pump demineralized water from a test tank through one SLC subsystem and into the RPV. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Demonstrating that all piping between the boron solution storage tank and the explosive valve 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 is followed by draining and flushing the piping with demineralized water).

Insert 2

~~The 18 month Frequency is acceptable since there is a low probability that the subject piping will be blocked due to precipitation of the boron from solution in the piping.~~ This is especially true in light of the temperature verification of this piping required by SR 3.1.7.3. However, if, in performing SR 3.1.7.3, it is determined that the temperature of this piping has fallen below the specified minimum, SR 3.1.7.9 must be performed once within 24 hours after the piping temperature is restored to ≥ 48°F.

SR 3.1.7.10

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

During normal operation, the SDV vent and drain valves should be in the open position (except when closed intermittently under administrative control for testing) 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.

Insert 2

~~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

SR 3.1.8.2 is an integrated test of the SDV vent and drain valves to verify total system performance. After receipt of a simulated or actual scram signal, the closure of the SDV vent and drain valves is verified. The closure time of 30 seconds after receipt of a scram signal is based on the bounding leakage case evaluated in the accident analysis. Similarly, after receipt of a simulated or actual scram reset signal, the opening of the SDV vent and drain valves is verified. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.1.1 that overlaps this Surveillance and the scram time testing of control rods in LCO 3.1.3 to provide complete testing of the assumed safety function. ~~The 18-month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18-month Frequency; therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert 2

REFERENCES

1. UFSAR, Section 4.5.2.2.2.3.

2. 10 CFR 100.

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

4. 10 CFR 50.67

BASES

ACTIONS

A.1

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

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

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

periodically

Insert 2

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

periodically

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

Insert 2

SR 3.2.2.2

Because the transient analysis takes credit for conservatism in the scram speed performance, it must be demonstrated that the specific scram speed distribution is consistent with that used in the transient analysis. SR 3.2.2.2 determines the value of τ, which is a measure of the actual scram speed distribution compared with the assumed distribution. For $\tau > 0$, the MCPR operating limit is then determined based on an interpolation between the applicable limits for TRACG Option A (scram times of LCO 3.1.4,"Control Rod Scram Times") and TRACG Option B (realistic scram times) analyses. The parameter τ and 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, and SR 3.1.4.4 because the effective scram speed distribution may change during the cycle. The 72 hour Completion Time is acceptable due to the relatively minor changes in τ expected during the fuel cycle.

REFERENCES

1. NUREG-0562, June 1979.

2. NEDO-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version).

3. UFSAR, Chapter 4.

4. UFSAR, Chapter 6.

5. UFSAR, Chapter 15.

BASES

APPLICABILITY

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

ACTIONS

A.1

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

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

periodically

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

Insert 2

BASES

SURVEILLANCE REQUIREMENTS

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

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RPS trip capability. For the case of the APRM Functions 2.a, 2.b, 2.c, and 2.d, RPS trip capability is maintained with any two OPERABLE APRMs remaining. 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. 9) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1 and SR 3.3.1.1.2

Performance of the CHANNEL CHECK ~~once every 12 hours or 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

Insert 2

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

SR 3.3.1.1.3

Insert 2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance when ≥ 25% RTP. ~~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 < 25% RTP is provided that requires the SR to be met only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 25% RTP. At low power levels, a high degree of accuracy is unnecessary because of the large, inherent margin to thermal limits (MCPR, LHGR, and APLHGR). At ≥ 25% 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 25% if the ~~7 day~~ Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 25% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.4

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

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

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

Insert 2

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

SR 3.3.1.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. In accordance with Reference 9, the scram contactors must be tested as part of the Manual

BASES

Insert 2

SURVEILLANCE REQUIREMENTS (continued)

Scram Function. ~~A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on References 9 and 10. (The Manual Scram Function's CHANNEL FUNCTIONAL TEST Frequency was credited in the Reference 9 analysis to extend many automatic scram Functions' Frequencies.)~~

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. This is required prior to fully withdrawing SRMs from the core since indication is being transitioned from the SRMs to the IRMs.

The overlap between IRMs and APRMs is of concern when reducing power into the IRM range. On power increases, the system design will prevent further increases (by initiating a rod block) if adequate overlap is not maintained. Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between MODE 1 and MODE 2 can be made without either APRM downscale rod block, or IRM upscale rod block. Overlap between SRMs and IRMs similarly exists when, prior to fully withdrawing the SRMs from the core, IRMs are above the downscale rod block and show increasing flux on range 1 before SRMs have reached 1/2 decade below 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~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 core power distribution calculated by the core monitoring system based on the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. ~~The 1000 MWD/T ("short" ton) Frequency is based on operating experience with LPRM sensitivity changes.~~

Insert 2

SR 3.3.1.1.9 and SR 3.3.1.1.13

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. ~~The 92 day Frequency of SR 3.3.1.1.9 is based on the reliability analysis of Reference 9.~~

Insert 2

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.10

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

Insert 2

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

SR 3.3.1.1.11 and SR 3.3.1.1.14

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

SR 3.3.1.1.11 Note 1 states that neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the ~~7 day~~ calorimetric calibration (SR 3.3.1.1.2 and the ~~1000 MWD/T~~ LPRM calibration against the TIPs (SR 3.3.1.1.8). SR 3.3.1.1.11 Note 2 is provided that requires the IRM SR to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 IRM Function 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The Frequency of SR 3.3.1.1.11 is based upon a 184 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.1.1.14 is based upon ≥ 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

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 APRM CHANNEL FUNCTIONAL TEST covers the APRM channels (including for Function 2.b only, the recirculation flow input function excluding the flow transmitter), the 2-out-of-4 voter channels, and the interface connections to 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 184 day Frequency of SR 3.3.1.1.12 is based on the reliability analysis of References 13 and 17.~~ (NOTE: The actual voting logic of the 2-out-of-4 voter channels is tested as part of SR 3.3.1.1.19.)

Insert 2

For Function 2.a, a Note that requires this SR to be performed within 12 hours of entering MODE 2 from MODE 1 is provided. 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.

SR 3.3.1.1.15 and SR 3.3.1.1.19

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods (LCO 3.1.3), and SDV vent and drain valves (LCO 3.1.8), overlaps this Surveillance to provide complete testing of the assumed safety function. For the 2-out-of-4 Voter Function, the LSFT includes simulating APRM and OPRM trip conditions at the APRM channel inputs to the 2-out-of-4 trip voter channel to check all combinations of two tripped inputs to the 2-out-of-4 trip voter logic in the voter channels.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The 18 month Frequency of SR 3.3.1.1.15 is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.~~

~~Additionally, the 24 month Frequency of SR 3.3.1.1.19 is based on Reference 13.~~

SR 3.3.1.1.16

This SR ensures that scrams initiated from the Turbine Stop Valve Closure and Turbine Control Valve Fast Closure Functions will not be inadvertently bypassed when THERMAL POWER is ≥ 29.5% RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. Additionally, consideration is given to the fact that main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from turbine first stage pressure; where turbine first stage pressure of 161.9 psig conservatively correlates to 29.5% RTP), the main turbine bypass valves must remain closed at THERMAL POWER ≥ 29.5% RTP to ensure that the calibration remains valid.

If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 29.5% 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 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.

Insert 2

~~The Frequency of 18 months is based on engineering judgment, reliability of the components, and ≥ 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.17

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. This test may be performed in one measurement or in overlapping segments, with verification that all components are tested. The RPS RESPONSE TIME acceptance criteria are included in Reference 10. RPS RESPONSE TIME for the APRM 2-out-of-4 Voter Function includes the output relays of the voter and the associated RPS relays and contactors. (The digital portion of the APRM and 2-out-of-4 voter channels are excluded from the 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.

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

The sensors and relays/logic components for Functions 3 and 4 are assumed to operate at the design response time. This allowance is supported by References 12 and 21, which determined that significant degradation of the channel response time can be detected during performance of other Technical Specification SRs.

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.18

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. For the APRM Simulated Thermal Power - Upscale Function, this SR also includes calibrating the associated recirculation loop flow channel.

SR 3.3.1.1.18 is modified by a Note that 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 ~~1000 MWD/T~~ LPRM calibration against the TIPs (SR 3.3.1.1.8).

Insert 2

~~The Frequency of SR 3.3.1.1.18 is based upon 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

Surveillance Requirement SR 3.3.1.1.18 for Function 2.b is modified by two Notes as identified in Table 3.3.1.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be within the as-left tolerance of the Nominal Trip Setpoint (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance

BASES

SURVEILLANCE REQUIREMENTS (continued)

procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the NTSPs and the methodologies for calculating the as-left and the as-found tolerances be in the Technical Requirements Manual.

SR 3.3.1.1.20

This SR ensures that scrams initiated from the OPRM Upscale Function (Function 2.f) will not be inadvertently bypassed when THERMAL POWER, as indicated by the APRM Simulated Thermal Power, is ≥ 27.5% RTP and recirculation drive flow is < 60% rated flow. This normally involves confirming the bypass setpoints. The bypass setpoint values are considered to be nominal values as discussed in Reference 20, and have been adjusted for power uprate. The surveillance ensures that the OPRM Upscale Function is enabled (not bypassed) for the correct values of APRM Simulated Thermal Power and recirculation drive flow.

If any bypass setpoint is nonconservative (i.e., the OPRM Upscale Function is bypassed when APRM Simulated Thermal Power ≥ 27.5% and recirculation drive flow < 60% rated), then the affected channel is considered inoperable for the OPRM Upscale Function. Alternatively, the bypass setpoint may be adjusted to place the channel in a conservative condition (unbypassed). If placed in the unbypassed condition, this SR is met and the channel is considered OPERABLE.

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

Insert 2

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

SR 3.3.1.2.2

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

Insert 2

~~The 12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities that include steps to ensure that the SRMs required by the LCO are in the proper quadrant.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.4

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

Insert 2

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

Insert 2

BASES

Insert 2

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.6 is required in MODE 2 with IRMs on Range 2 or below, and in MODES 3 and 4. ~~Since core reactivity changes do not normally take place in MODES 3 and 4, and since core reactivity changes in MODE 2 are typically due to control rod movement, 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 SR 3.3.1.2.5 and Note 1 to SR 3.3.1.2.6 modify this requirement to not require the signal-to-noise ratio to be determined when the associated SRM count rate is ≥ 3.0 cps. This is acceptable since there is no limitation on signal-to-noise ratio when the SRM is ≥ 3.0 cps.

The Note 2 to SR 3.3.1.2.6 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 desire not 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.7

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

Insert 2

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. ~~If not performed within the previous 18 months (plus 25% allowed by SR 3.0.2),~~ the SR must be performed within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the ~~18 month~~ Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the desire not to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

REFERENCES None.

BASES

SURVEILLANCE REQUIREMENTS (continued)

specific sequence developed for power suppression of failed fuel may not allow any deviations).

SR 3.3.2.1.1 is performed during startup. As noted in the SRs, SR 3.3.2.1.1 is not required to be performed until 1 hour after any control rod is withdrawn at ≤ 10% RTP in MODE 2. The SR 3.3.2.1.2 CHANNEL FUNCTIONAL TEST is performed by attempting to insert and withdraw a control rod not in compliance with the prescribed sequence and verifying a selection error is indicated and a control rod insert and withdraw block (respectively) occur. SR 3.3.2.1.2 is performed during a plant shutdown when transitioning to ≤ 10% RTP. As noted, SR 3.3.2.1.2 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 3.3.2.1.1, and THERMAL POWER reduction to ≤ 10% RTP when in MODE 1 for SR 3.3.2.1.2, to perform the required Surveillance if the ~~92 day~~ Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs. ~~The Frequencies are based on operating experience that shows the RWM usually passes the Surveillance when performed at these Frequencies.~~

Insert 2

SR 3.3.2.1.3

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

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. ~~The Frequency of 184 days is based on reliability analyses (Ref. 9).~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.4

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 is present.

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

Insert 2

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

SR 3.3.2.1.5

The power at which the RBM is automatically bypassed is based on the APRM signal's input to each RBM channel. Below the minimum power setpoint, the RBM is automatically bypassed. This power Allowable Value must be verified periodically to be less than 30% RTP. If this setpoint is nonconservative, then the affected RBM channel is considered inoperable. Alternatively, the power range channel can be placed in the conservative condition (i.e., enabling the RBM Function). If placed in this condition, the SR is met and the RBM channel is not considered inoperable. ~~The 24 month Frequency is based on the actual trip setpoint methodology utilized for these channels.~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.6

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

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 surveilled in SR 3.3.1.1.1 and SR 3.3.1.1.7.

Insert 2

~~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

The RWM will only enforce the proper control rod sequence if the rod sequence is properly input into the RWM computer. This SR ensures that the proper sequence is loaded into the RWM so that it can perform its intended function. Control rod withdrawal sequences are normally established consistent with the rules of the generic BPWS analysis. Occasionally, operational limitations (e.g., power suppression of failed fuel) may dictate the insertion of control rods which do not meet the minimum cell separation criteria of the generic BPWS analysis. In such situations, sufficient cycle specific analyses are performed to demonstrate that the resulting control rod worths of the modified control rod withdrawal sequence are bounded by the rod worths allowed by rigorously following the rules of the generic BPWS analysis, thereby assuring that the 280 cal/gm fuel damage limit will not be violated during a CRDA.

The "prescribed withdrawal sequence" is defined as the combination of both the procedurally specified control rod movement sequence and any analytically allowed deviations from this sequence. Some prescribed withdrawal sequences (e.g., BPWS) have more flexibility in allowed deviations than other prescribed withdrawal sequences (e.g., a cycle-

BASES

SURVEILLANCE REQUIREMENTS (continued)

specific sequence developed for power suppression of failed fuel may not allow any deviations).

The Surveillance is performed once prior to declaring the RWM OPERABLE following loading of the prescribed withdrawal sequence into the RWM, since this is when rod sequence input errors are possible.

REFERENCES

1. UFSAR, Section 7.6.2.13.5.

2. UFSAR, Section 7.6.1.20.

3. General Electric Energy, "Maximum Extended Operating Domain Analysis for Detroit Edison Company Enrico Fermi Energy Center Unit 2," NEDC - 31843P, July 1990.

4. NEDE-24011-P-A-10-US, "General Electric Standard Application for Reload Fuel," Supplement for United States, March 1991.

5. "Modifications to the Requirements for Control Rod Drop Accident Mitigating Systems," BWR Owners' Group, July 1986.

6. NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.

7. NRC SER, "Acceptance of Referencing of Licensing Topical Report NEDE-24011-P-A," "General Electric Standard Application for Reactor Fuel, Revision 8, Amendment 17," December 27, 1987.

8. NEDC-30851-P-A, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

~~9. NEDC-32410P-A, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function," October 1995, and Supplement 1, May 1996.~~

BASES

ACTIONS (continued)

The 2 hour Completion Time is sufficient for the operator to take corrective action, and takes into account the likelihood of an event requiring actuation of feedwater and main turbine high water level trip instrumentation occurring during this period. It is also consistent with the 2 hour Completion Time provided in LCO 3.2.2 for Required Action A.1, since this instrumentation's purpose is to preclude a MCPR violation.

C.1

With the required channels not restored to OPERABLE status or placed in trip, THERMAL POWER must be reduced to < 25% RTP within 4 hours. As discussed in the Applicability section of the Bases, operation below 25% RTP results in sufficient margin to the required limits, and the feedwater and main turbine high water level trip instrumentation is not required to protect fuel integrity during analyzed events. The allowed Completion Time of 4 hours is based on operating experience to reduce THERMAL POWER to < 25% RTP from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.2.2.1

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

SR 3.3.2.2.2

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

Insert 2

~~The Frequency of 31 days is reasonable, based on operating experience and on other Surveillances that ensure proper functioning between CHANNEL FUNCTIONAL TESTS. Furthermore, operating experience shows that failure of more than one channel in a given 31 day period is a rare event.~~

SR 3.3.2.2.3

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the feedwater and main turbine valves is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a valve is incapable of operating, the associated instrumentation would also be inoperable. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.~~

Insert 2

REFERENCES

1. UFSAR, Section 15.1.2.
2. UFSAR, Section 15.3.

BASES

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.1.2

Insert 2

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

~~The 18 month Frequency for all channels is based on operating experience and consistency with the typical industry refueling cycles.~~

The CHANNEL CALIBRATION for Primary Containment High Range Radiation Monitor 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.

REFERENCES

1. Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Rev. 2, December 1980.

2. Detroit Edison Letter NRC-89-0148, "Additional Clarification to Fermi 2 Compliance to Regulatory Guide 1.97, Revision 2," dated June 19, 1989.

3. Detroit Edison Letter NRC-89-201, "Regulatory Guide 1.97 Revision 2 Design Review," dated September 12, 1989.

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

SR 3.3.3.2.1

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

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

Insert 2

~~The Frequency is based upon plant operating experience that demonstrates channel failure is rare.~~

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 and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the plant can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. ~~Operating experience demonstrates that Remote Shutdown System control channels usually pass the Surveillance when performed at the 18 month Frequency.~~

Insert 2

SR 3.3.3.2.3

Insert 2

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

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

REFERENCES

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

BASES

ACTIONS (continued)

D.1 and D.2

With any Required Action and associated Completion Time not met, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 2 within 6 hours (Required Action D.2). Alternately, the associated recirculation pump may be removed from service since this performs the intended function of the instrumentation (Required Action D.1). The allowed Completion Time of 6 hours is reasonable, based on operating experience, both to reach MODE 2 from full power conditions and to remove a recirculation pump from service in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into the associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains ATWS-RPT trip capability. Upon completion of the Surveillance, or expiration of the 2 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. The 2 hour testing allowance does not significantly reduce the probability that the recirculation pumps will trip when necessary.

SR 3.3.4.1.1

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

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

SR 3.3.4.1.2

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

Insert 2

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

~~The Frequency of 31 days is reasonable, based on operating experience and on other Surveillances that ensure proper functioning between CHANNEL FUNCTIONAL TESTS. Furthermore, operating experience shows that the failure of more than one channel in a given 31 day period is a rare event.~~

SR 3.3.4.1.3

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

SR 3.3.4.1.4

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

Insert 2

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

REFERENCES

1. UFSAR, Figure 7.7-3, Reactor Recirculation System FCD.

BASES

SURVEILLANCE REQUIREMENTS

As noted in the beginning of the SRs, the SRs for each ECCS instrumentation Function are found in the SRs column of Table 3.3.5.1-1.

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

SR 3.3.5.1.1

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

SR 3.3.5.1.2 and SR 3.3.5.1.6

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

Insert 2

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

~~The Frequency of 92 days for SR 3.3.5.1.2 is based on the reliability analyses of Reference 4. The Frequency of 18 months for SR 3.3.5.1.6 is based on engineering judgement and the reliability of the components.~~

SR 3.3.5.1.3

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.4

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

Insert 2

~~The Frequency of SR 3.3.5.1.4 is based upon the assumption of a ≥ 18 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.

Insert 2

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

REFERENCES

1. UFSAR, Section 6.3.

2. UFSAR, Chapter 15.

3. NEDC-31982-P, "SAFER/GESTR-LOCA, Loss-of-Coolant Accident Analysis, including Errata and Addenda No. 1," April 1992.

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

BASES

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 (b) for up to 6 hours for Functions 1 and 3 provided the associated Function maintains RCIC initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RCIC will initiate when necessary.

SR 3.3.5.2.1

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

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2.2 and SR 3.3.5.2.6

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

Insert 2

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

~~The Frequency of 92 days for SR 3.3.5.2.2 is based on the reliability analysis of Reference 1. The Frequency of 18 months for SR 3.3.5.2.6 is based on engineering judgement and the reliability of the components.~~

SR 3.3.5.2.3

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2.4

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

Insert 2

~~The Frequency of SR 3.3.5.2.4 is based upon the assumption of a ≥ 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.5.2.5

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

Insert 2

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

REFERENCES

1. Safety Evaluation Report for Fermi Unit-2 Amendment No. 75, dated September 6, 1991.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

Insert 2

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

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

SR 3.3.6.1.2 and SR 3.3.6.1.6

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The 92 day Frequency of SR 3.3.6.1.2 is based on the reliability analysis described in References 5 and 6. The 18 month Frequency of SR 3.3.6.1.6 is based on engineering judgment and the reliability of the individual valve control components.~~

SR 3.3.6.1.3

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

Insert 2

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

SR 3.3.6.1.4

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

Insert 2

~~The Frequency of SR 3.3.6.1.4 is based on the assumption of a ≥ 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

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 18 month Frequency is based on the need to perform this~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.~~

SR 3.3.6.1.7

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The response time must be added to the PCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME.

References 10 and 11 provide justification for elimination of Response Time Testing for all Primary Containment Isolation Instrumentation components except the Main Steam Line Isolation Instrumentation DC Output Relays, thus these components are required to be Response Time Tested.

The Main Steam Line Isolation Instrumentation DC Output Relays operate in parallel with the Main Steam Line Isolation Instrumentation AC Output Relays and are expected to have similar performance. The Main Steam Line Isolation Instrumentation DC Output Relays are common to Table 3.3.6.1-1, Functions 1.a, b, c, d, e, f, and g and may be tested using any of these functions.

ISOLATION SYSTEM RESPONSE TIME acceptance criteria for the instrumentation portion are included in Reference 7, while the acceptance criteria for the PCIV closure times are included in Reference 8. This test may be performed in one measurement, or in overlapping segments, with verification that all components are tested.

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

Insert 2

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

SR 3.3.6.2.2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

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

SR 3.3.6.2.3

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

Insert 2

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

SR 3.3.6.2.4

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

Insert 2

~~The Frequency of SR 3.3.6.2.4 is based on the assumption of a ≥ 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.5

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

Insert 2

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

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

REFERENCES

1. UFSAR, Section 6.3.

2. UFSAR, Chapter 15.

3. UFSAR, Section 15.7.4.

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

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

BASES

ACTIONS (continued)

C.1

If any Required Action and associated Completion Time of Conditions A or B are not met, or two LLS valves are inoperable due to inoperable channels, the LLS valves may be incapable of performing their intended function. Therefore, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours.

SURVEILLANCE REQUIREMENTS

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

SR 3.3.6.3.1 and SR 3.3.6.3.2

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

Insert 2

~~The Frequency of 31 days is reasonable, based on operating experience and on other indications that ensure proper functioning between CHANNEL FUNCTIONAL TESTS. Furthermore, operating experience shows that failure of more than one channel in a given 31 day period is a rare event.~~

A portion of the SRV tailpipe pressure switch instrument channels are located inside the primary containment. The allowance for SR 3.3.6.3.2 to only perform the CHANNEL FUNCTIONAL TEST for portions of the channel outside of the primary containment is based on the location of these instruments and ALARA considerations and the requirement for

BASES

SURVEILLANCE REQUIREMENTS (continued)

a complete CHANNEL CALIBRATION (SR 3.3.6.3.3) and LSFT (SR 3.3.6.3.4) ~~every 18 months~~.

SR 3.3.6.3.3

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

Insert 2

~~The Frequency of once every 18 months for SR 3.3.6.3.3 is based on the assumption of a ≥ 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

SR 3.3.6.3.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specified channel. The system functional testing performed in LCO 3.6.1.6, "Low-Low Set (LLS) Safety/Relief Valves (SRVs)," for SRVs overlaps this test to provide complete testing of the assumed safety function.

Insert 2

~~The Frequency of once every 18 months for SR 3.3.6.3.4 is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.~~

REFERENCES

1. UFSAR, Figure 7.3-13.
2. UFSAR, Section 5.2.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.1

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

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

Insert 2

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

SR 3.3.7.1.2 and SR 3.3.7.1.3

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The Frequency of 31 days is reasonable, based on operating experience and on other Surveillances that ensure proper functioning between CHANNEL FUNCTIONAL TESTS. Furthermore, operating experience shows that failure of more than one channel in a given 31 day period is a rare event.~~

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

SR 3.3.7.1.4

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

Insert 2

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

SR 3.3.7.1.5

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.7.3, "Control Room Emergency Filtration (CREF) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

Insert 2

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

REFERENCES

1. UFSAR, Figure 9.4.2.
2. UFSAR, Section 9.4.1.
3. UFSAR, Section 6.4.1.
4. UFSAR, Chapter 15.
5. Safety Evaluation Report for Fermi Unit-2 Amendment No. 75, dated September 6, 1991.

BASES

ACTIONS (continued)

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 72 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration of channels.

B.1

If Required Action A.1 and associated Completion Time is not met, or the associated Function is not capable of performing the intended function, the associated EDG(s) is declared inoperable immediately. This requires entry into applicable Conditions and Required Actions of LCO 3.8.1 and LCO 3.8.2, which provide appropriate actions for the inoperable EDG(s).

SURVEILLANCE REQUIREMENTS

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

SR 3.3.8.1.1

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

Insert 2

~~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 3.3.8.1.2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

methodology. This SR also ensures the sum of the degraded voltage time delay and the longest time delay of the four associated bus undervoltage relays remains consistent with the plant specific setpoint methodology.

Insert 2

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

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

SR 3.3.8.1.3

Insert 2

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

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

REFERENCES

1. UFSAR, Figure 8.3-8.
2. UFSAR, Section 3.6.
3. UFSAR, Section 6.3.
4. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS (continued)

is

The ~~184 day Frequency and the~~ Note in the Surveillance ~~are~~ based on guidance provided in Generic Letter 91-09 (Ref. 3).

Insert 2

SR 3.3.8.2.2

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

Insert 2

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

SR 3.3.8.2.3

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

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

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

Insert 2

BASES

ACTIONS

A.1

An inoperable jet pump can increase the blowdown area and reduce the capability of reflooding during a design basis LOCA. If one or more of the jet pumps are inoperable, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. The 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 3.4.2.1

This SR is designed to detect significant degradation in jet pump performance that precedes jet pump failure (Ref. 2). This SR is required to be performed only when the loop has forced recirculation flow since surveillance checks and measurements can only be performed during jet pump operation (this includes performing this SR when the loop is operating but may be declared "not in operation" in accordance with the ACTIONS of LCO 3.4.1). The jet pump failure of concern is a complete mixer displacement due to jet pump beam failure. Jet pump plugging is also of concern since it adds flow resistance to the recirculation loop. Significant degradation is indicated if the specified criteria confirm unacceptable deviations from established patterns or relationships. The allowable deviations from the established patterns have been developed based on the variations experienced at plants during normal operation and with jet pump assembly failures (Refs. 2 and 3). Each recirculation loop must satisfy two of the performance criteria provided. Since refueling activities (fuel assembly replacement or shuffle, as well as any modifications to fuel support orifice size or core plate bypass flow) can affect the relationship between core flow, jet pump differential pressures, recirculation pump speed, and recirculation loop drive flow, these relationships may need to be re-established each cycle. Similarly, initial entry into extended single loop operation may also require establishment of these relationships. During the initial weeks of operation under such conditions, while base-lining new "established patterns", engineering judgement of the ~~daily~~ surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The recirculation pump speed operating characteristics (loop drive flow versus pump speed and loop drive flow versus total core flow) 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 criterion a., the loop drive flow versus pump speed relationship must be verified. For criterion b., the loop drive flow versus total core flow relationship must be verified.

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

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

Insert 2

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The 18 month Frequency was developed based on the SRV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 3). Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. UFSAR, Section 5.2.2.3.5.
2. UFSAR, Chapter 15.
3. ASME, Boiler and Pressure Vessel Code, Section XI.

BASES

ACTIONS (continued)

C.1 and C.2

If any Required Action and associated Completion Time of Condition A or B is not met or if pressure boundary LEAKAGE exists, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant 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 (e.g., Primary Containment Atmospheric Gaseous Radioactivity, RPV head flange leak detection, and sump monitoring systems). 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. ~~In conjunction with alarms and other administrative controls, an 8 hour Frequency for this Surveillance is appropriate for identifying LEAKAGE and for tracking required trends (Ref. 6).~~

Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. GEAP-5620, April 1968.
3. NUREG-76/067, October 1975.
4. UFSAR, Section 5.2.7.4.3.3.
5. Regulatory Guide 1.45.
~~6. Generic Letter 88-01, Supplement 1.~~

BASES

LCO (continued)

unidentified LEAKAGE, depending on the origin and magnitude of the LEAKAGE. This sensitivity is acceptable for containment sump level monitoring OPERABILITY.

The LCO is satisfied when monitors of diverse measurement means are available. Thus, the drywell floor drain sump flow monitoring system, in combination with the gaseous primary containment atmosphere radioactivity monitor, and the drywell floor drain sump level monitoring system provides an acceptable minimum.

APPLICABILITY

In MODES 1, 2, and 3, leakage detection systems are required to be OPERABLE to support LCO 3.4.4. This Applicability is consistent with that for LCO 3.4.4.

ACTIONS

A.1

With the drywell floor drain sump flow monitoring system inoperable, the plant has lost one means to quantify leakage. However, the primary containment atmosphere gaseous radioactivity monitoring system and the drywell floor drain sump level monitoring system will provide indication of changes in leakage.

determination via SR 3.4.4.1

With the drywell floor drain sump flow monitoring system inoperable, but with RCS unidentified and total LEAKAGE ~~being determined every 12 hours (SR 3.4.4.1)~~, operation may continue for 30 days. The 30 day Completion Time of Required Action A.1 is acceptable, based on operating experience, considering the multiple forms of leakage detection that are still available.

B.1

With the primary containment atmosphere gaseous radioactivity monitoring system inoperable, grab samples of the primary containment atmosphere must be taken and analyzed to provide periodic leakage information. Provided a sample is obtained and analyzed every 24 hours, the plant may continue operation since at least one other form of drywell leakage detection (i.e., drywell floor drain sump level monitoring system) is available.

The 24 hour interval provides periodic information that is adequate to detect LEAKAGE.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

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

Insert 2

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 Frequency of 31 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.~~

Insert 2

SR 3.4.6.3

This SR is for the performance of a CHANNEL CALIBRATION of required leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. ~~The Frequency of 18 months is a typical refueling cycle and considers channel reliability. Operating experience has proven this frequency is acceptable.~~

Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.
2. Regulatory Guide 1.45, Revision 0, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.
3. UFSAR, Section 5.2.7.1.3.
4. GEAP-5620, April 1968.
5. NUREG-75/067, October 1975.
6. UFSAR, Section 5.2.7.4.3.3.
7. NUREG/CR-6861, December 2004

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

Insert 2

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

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

REFERENCES

1. 10 CFR 100.11.
2. UFSAR, Section 15.6.4.
3. 10 CFR 50.67.

BASES

ACTIONS (continued)

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

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

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

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

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This Surveillance verifies that one RHR shutdown cooling subsystem or recirculation pump is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. ~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room.~~ Insert 2

This Surveillance is modified by a Note allowing sufficient time to align the RHR System for shutdown cooling operation after clearing the pressure interlock that isolates the system, or for placing a recirculation pump in operation. The Note takes exception to the requirements of the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

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

Insert 2

REFERENCES

None.

BASES

ACTIONS (continued)

C.1 and C.2

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

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

Condition C is modified by a Note requiring Required Action A.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1

Insert 2

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

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

increase, or flow increase.

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

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

SR 3.4.10.7, SR 3.4.10.8, and SR 3.4.10.9

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

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

Insert 2

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

BASES

ACTIONS

A.1

With the reactor steam dome pressure greater than the limit, prompt action should be taken to reduce pressure to below the limit and return the reactor to operation within the bounds of the reactor pressure vessel overpressure 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 a reactor pressure vessel overpressure 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 reactor pressure vessel overpressure 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 ≤ 1045 psig ensures that the initial conditions of the reactor pressure vessel overpressure protection analysis are met. ~~Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.~~

Insert 2

REFERENCES

1. UFSAR, Section 5.2.2.3.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

required

The LPCI System injection valves, recirculation pump discharge valves, and LPCI cross-tie valve are powered from the LPCI swing bus, which must remain energized to support OPERABILITY of both LPCI subsystems. Therefore, verification of proper voltage and correct breaker alignment to the swing bus is ~~made every 7 days.~~ The correct breaker alignment ensures the appropriate separation and independence of the electrical power sources are maintained and appropriate sources of electrical power are available, and the appropriate voltage is available to the swing bus, including verification that the swing bus is energized from its normal source (bus 72C). The verification of proper voltage availability ensures that the required voltage is readily available for critical system loads connected to this bus. ~~The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC swing bus electrical power sources, and other indications available in the control room that alert the operator to subsystem malfunctions.~~

Insert 2

SR 3.5.1.2

The LPCI System injection valves, recirculation pump discharge valves, and LPCI cross-tie valve are powered from the LPCI swing bus, which must remain energized during any single failure, including loss of power from the normal feed to the swing bus. Therefore the automatic throwover scheme is functionally tested (by manually opening position 3C of bus 72C) to verify the capability of the throwover scheme to detect loss of normal power, and initiate an automatic transfer to the swing bus emergency power source. Verification ~~every 31 days~~ that the LPCI swing bus automatic throwover scheme functions properly demonstrates that AC electrical power is available to ensure proper operation of the associated LPCI injection valves, recirculation pump discharge valves, and LPCI cross-tie valve. The swing bus automatic throwover scheme must be OPERABLE for both LPCI subsystems to be OPERABLE. ~~The 31 day Frequency has been found acceptable based on engineering judgment and operating experience.~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note to indicate that when this test results in LPCI inoperability solely for performance of this required Surveillance, or when the LPCI swing bus automatic throwover scheme is inoperable due to EDG-12 being paralleled to the bus for required testing, entry into associated Conditions and Required Actions may be delayed for up to 12 hours until the required testing is completed. Upon completion of the Surveillance or expiration of the 12 hour allowance the swing bus must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. The LPCI swing bus automatic throwover scheme is typically not inoperable when EDG-12 is paralleled to the bus for testing purposes.

SR 3.5.1.3

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

Insert 2

SR 3.5.1.4

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 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 non-accident 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

Insert 2

~~The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve position would 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, and for 4 hours after exceeding the RHR cut-in permissive pressure in MODE 3, if capable of being manually realigned (remote or local) to the LPCI mode and not otherwise inoperable. This allows operation in the RHR shutdown cooling mode during MODE 3, if necessary and sufficient time to restore the system line up to the LPCI mode of operation.

SR 3.5.1.5

Verification ~~every 31 days~~ that ADS primary containment pneumatic supply pressure is ≥ 75 psig ensures adequate air or nitrogen 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 five valve actuations can occur with the drywell at the long term drywell pressure of the design basis small break LOCA analysis (Ref. 15). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ 75 psig is provided by the primary pneumatic supply system. ~~The 31 day Frequency takes into consideration administrative controls over operation of the pneumatic system and alarms for low pneumatic pressure.~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.6

Verification ~~every 31 days~~ that the RHR System power operated cross-tie valve is open ensures that each LPCI subsystem remains capable of injection into the selected recirculation loop. A valve that is inaccessible may be verified by administrative controls. If a RHR System cross-tie valve is not open, both LPCI subsystems must be considered inoperable. ~~The 31 day Frequency has been found acceptable, considering that these valves are under strict administrative controls that will ensure the valves continue to remain open.~~

Insert 2

SR 3.5.1.7

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

Insert 2

~~The specified Frequency is 18 months. Verification each 18 months is an exception to the normal Inservice Testing Program generic valve cycling Frequency of 92 days, but is considered acceptable due to the demonstrated reliability of these valves.~~ If the valve is inoperable and in the open position, both LPCI subsystems must be declared inoperable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Therefore, SR 3.5.1.9 and SR 3.5.1.10 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 3.5.1.8 and SR 3.5.1.9 is in accordance with the Inservice Testing Program requirements. ~~The 18 month Frequency for SR 3.5.1.10 is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert 2

SR 3.5.1.11

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

Insert 2

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.5.1.12

The ADS designated SRVs 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 3.5.1.13 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.

Insert 2

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

This SR is modified by a Note that excludes valve actuation.

SR 3.5.1.13

Valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME Code requirements, prior to valve installation. Actuation of each required ADS valve is performed to verify that mechanically the valve is functioning properly. Tests are required to demonstrate:

- That each ADS SRV solenoid valve ports pneumatic pressure to the associated SRV actuator when energized;
- That each ADS SRV pilot stage actuates to open the associated main stage when the pneumatic actuator is pressurized; and

BASES

SURVEILLANCE REQUIREMENTS (continued)

- That each ADS SRV main stage opens and passes steam when the associated pilot stage actuates.

The solenoid valves are functionally tested once per cycle as part of the Inservice Testing Program. The actuators and main stages are bench tested, together or separately, as part of the certification process. Maintenance procedures ensure that the SRV actuators and main stages are correctly installed in the plant, and that the SRV and associated piping remain clear of foreign material that might obstruct valve operation or full steam flow. This approach provides adequate assurance that the required ADS valves will operate when actuated, while minimizing the challenges to the valves and the likelihood of leakage or spurious operation. Two-stage actuator assemblies are not tested in-situ due to a probability of causing unseating or leakage of the pilot stage which can lead to spurious actuation or failure to reclose. 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.

This SR does not preclude manually opening SRVs; for example, in accordance with the IST Program or as corrective action for an SRV with excessive leakage.

Insert 2

~~The Frequency is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.5.1.14

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Reference 16. This SR is modified by a Note stating that the ECCS instrumentation response times are not required to be measured. The contribution of the instrument response times to the overall ECCS response time are assumed based on guidance of Reference 17.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

provide adequate makeup if the RPV were completely drained. Therefore, only one CS subsystem is allowed to use the CST. This ensures the other required ECCS subsystem has adequate makeup volume.

~~The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool water level and CST water level variations and instrument drift during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool or CST water level condition.~~

SR 3.5.2.3

required.

The LPCI System injection valves, recirculation pump discharge valves, and LPCI cross-tie valve are powered from the LPCI swing bus, which must remain energized to support OPERABILITY of any required LPCI subsystem. Therefore, verification of proper voltage and correct breaker alignment to the swing bus is ~~made every 7 days.~~ The correct breaker alignment ensures the appropriate electrical power sources are available, and the appropriate voltage is available to the swing bus, including verification that the swing bus is energized. The verification of proper voltage availability ensures that the required voltage is readily available for critical system loads connected to this bus. ~~The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC swing bus electrical power sources, and other indications available in the control room that alert the operator to subsystem malfunctions.~~

Insert 2

SR 3.5.2.4, SR 3.5.2.6, and SR 3.5.2.7

The Bases provided for SR 3.5.1.3, SR 3.5.1.8, and SR 3.5.1.11 are applicable to SR 3.5.2.4, SR 3.5.2.6, and SR 3.5.2.7, respectively.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.5

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. ~~The 31 day Frequency is appropriate because the valves are operated under procedural control and the probability of their being mispositioned during this time period is low.~~ Insert 2

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

REFERENCES

1. UFSAR, Section 6.3.2.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

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

Insert 2

SR 3.5.3.2

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.3 and SR 3.5.3.4

The RCIC pump flow rates ensure that the system can maintain reactor coolant inventory during pressurized conditions with the RPV isolated. The flow tests for the RCIC System are performed at two different pressure ranges such that system capability to provide rated flow is tested both at the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the RCIC System diverts steam flow. Reactor steam pressure must be ≥ 945 psig to perform SR 3.5.3.3 and ≥ 150 psig to perform SR 3.5.3.4. Adequate steam flow is represented by the main turbine generator on line or turbine bypass valves open at least 2%. 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.

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 that the RCIC System will automatically restart on an RPV low water level (Level 2) signal received subsequent to an RPV high water level (Level 8) trip and that the suction is automatically transferred from the CST to the suppression pool. The LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.2 overlaps this Surveillance to provide complete testing of the assumed safety function.

Insert 2

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

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. UFSAR, Section 5.5.6.

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

Satisfactory performance of this SR can be achieved by establishing a known differential pressure between the drywell and the suppression chamber and verifying that the pressure between the suppression chamber and the drywell does not change by more than 0.2 inch of water per minute over a 10 minute period. This leakage is equivalent to that through a 1 inch diameter orifice at a differential pressure of approximately 1 psid. ~~The leakage test is performed every 18 months. The 18 month Frequency was developed considering it is prudent that this Surveillance be performed during a unit outage and also in view of the fact that component failures that might have affected this test are identified by other primary containment SRs.~~ Two consecutive test failures, however, would indicate unexpected degradation; in this event, as the Note indicates, increasing the Frequency to once every 9 months is required until the situation is remedied as evidenced by passing two consecutive tests.

SR 3.6.1.1.3

The primary containment suppression chamber can experience significant hydrodynamic loading during safety/relief valve (SRV) operation with the suppression pool average water temperature ≥ 160°F and reactor coolant system pressure > 200 psig. After SRV operation during these conditions, a visual examination of the exterior surface of the suppression chamber will identify any abnormal conditions that may warrant further inspection and review for continued OPERABILITY. This examination is performed prior to resuming operation in MODES where primary containment is required to be OPERABLE.

REFERENCES

1. UFSAR, Section 6.2.

2. UFSAR, Section 15.6.5.

3. 10 CFR 50, Appendix J, Option B.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR, requiring the results to be evaluated against the acceptance criteria which is applicable to SR 3.6.1.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C primary containment leakage rate.

SR 3.6.1.2.2

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

Insert 2

REFERENCES

1. UFSAR, Section 3.8.2.1.3.4.
2. 10 CFR 50, Appendix J, Option B.
3. UFSAR, Section 6.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

valves may be opened for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open. The purge valves (6 inch, 10 inch, 20 inch, and 24 inch) and the containment pressure control valves (1 inch) are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. ~~The 31 day Frequency is consistent with other PCIV requirements discussed in SR 3.6.1.3.2.~~

Insert 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 is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design limits.

This SR does not require any testing or valve manipulation. Rather, it involves verification that those PCIVs outside primary containment, and capable of being mispositioned, are in the correct position. ~~Since verification of valve position for PCIVs outside primary containment is relatively easy, the 31 day Frequency was chosen to provide added assurance that the PCIVs are in the correct positions.~~

Insert 2

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.3

This SR verifies that each primary containment isolation manual valve and blind flange that is located inside primary containment and is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside 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 31 day Frequency is based on operating experience that has demonstrated the reliability of the explosive charge continuity.~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.5

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

SR 3.6.1.3.6

For primary containment purge valves with resilient seals (6 inch, 10 inch, 20 inch, and 24 inch), additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option B (Ref. 3), is required to ensure OPERABILITY. This will ensure that leakage is $\leq 0.05\ L_a$ when tested at P_a. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. ~~Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between primary containment and the environment), a Frequency of 184 days was established.~~

Insert 2

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

performing this SR within 92 days

The primary containment purge valves are only required to meet leakage rate testing requirements in MODES 1, 2, and 3. (i.e., no isolation instrumentation functions of LCO 3.3.6.1 are required to be OPERABLE for purge system isolation outside of 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 (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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 10 CFR 100 or 10 CFR 50.67 limits. The minimum stroke time ensures that isolation does not result in a pressure spike more rapid than assumed in the transient analyses. The Frequency of this SR is in accordance with the requirements of the Inservice Testing Program.

SR 3.6.1.3.8

Insert 2

Automatic PCIVs close on a primary containment isolation signal to prevent leakage of radioactive material from primary containment following a DBA. This SR ensures that each automatic PCIV will actuate to its isolation position on a primary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.1.5 overlaps this SR to provide complete testing of the safety function. ~~The 18 month Frequency was developed considering it is prudent that this Surveillance be performed only during a unit outage since isolation of penetrations would eliminate cooling water flow and disrupt the normal operation of many critical components. Operating experience has shown that these components usually pass this Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.6.1.3.9

This SR requires a demonstration that a representative sample of reactor instrumentation line excess flow check valves (EFCVs) are OPERABLE by verifying that each tested valve restricts flow on a simulated instrument line break. The representative sample consists of an approximately equal number of EFCVs (about 15), from different plant locations and operating environments, such that each EFCV is tested ~~at least once every ten years~~. The representative sample testing reflects the operability status of all EFCVs in the plant. This SR provides assurance that the instrumentation line EFCVs will perform so that predicted radiological consequences will not be exceeded during the postulated instrument line break event evaluated in Reference 5.

(Ref. 6)

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The 18 month representative sample test frequency is based on the typical performance 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. The nominal ten-year maximum limit is based on performance testing. Any EFCV failure will be evaluated per the Corrective Action and the Maintenance Rule programs to determine if additional testing is warranted to ensure overall reliability is maintained. Operating experience has demonstrated that these components are highly reliable and that failures to isolate are very infrequent. Therefore, testing of a representative sample was concluded to be acceptable from a reliability standpoint (Reference 6).~~

SR 3.6.1.3.10

The TIP shear isolation valves are actuated by explosive charges. An in place functional test is not possible with this design. The explosive squib is removed and tested to provide assurance that the valves will actuate when required. The replacement charge for the explosive squib shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. No squib will remain in service beyond the expiration of its shelf life or its operating life. ~~The Frequency of 18 months on a STAGGERED TEST BASIS is considered adequate given the administrative controls on replacement charges and the frequent checks of circuit continuity (SR 3.6.1.3.4).~~

Insert 2

SR 3.6.1.3.11

This SR ensures that the leakage rate of secondary containment bypass leakage paths is $\leq$ 0.10 L_a. This provides assurance that the assumptions in the radiological evaluations of Reference 1 are met. The leakage rate of each bypass leakage path is assumed to be the maximum pathway leakage (leakage through the worse of the two isolation valves) unless the penetration is isolated by use of one closed and de-activated automatic valve, closed manual valve, or blind flange. In this case, the leakage rate of the isolated bypass leakage path is assumed to be the actual pathway leakage through the isolation device. If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. The frequency is required by the Primary

BASES

ACTIONS (continued)

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.1.4.1

Insert 2

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

REFERENCES

1. UFSAR, Section 6.2.

2. UFSAR, Section 6.2.1.2.1.10.

3. GENE 770-18, "Fermi-2 Containment Analysis Parametric Study," March 1991.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.5.1

Verifying that the drywell average air temperature is within the LCO limit ensures that operation remains within the temperature limits for the primary containment. Drywell air temperature is monitored in all zones and at various elevations. Due to the shape of the drywell, a volumetric average is used to determine an accurate representation of the actual average temperature. This is accomplished by averaging at least one reading at each of the following elevations:

a. 590 ft, 0 inches (azimuth 90°, 135°, 270°, or 316°)
b. 597 ft, 0 inches (azimuth 35°, 75°, 93°, 135°, 175°, 200°, 246°, 272°, 306°, or 345°)
c. 621 ft, 8 inches (azimuth 0°, 90°, 180°, 270°)
d 648 ft, 6 inches (azimuth 45°, 135°, 225°, 315°)
e. 662 ft, 0 inches (azimuth 0°, 90°, 180°, 285°)
f. 665 ft, 6 inches (azimuth 0° or 180°)

Insert 2

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

REFERENCES

1. UFSAR, Section 6.2.
2. UFSAR, Table 6.2-1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

This SR does not preclude manually opening SRVs; for example, in accordance with the IST Program or as corrective action for an SRV with excessive leakage.

~~The 18 month Frequency was based on the SRV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 3). Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.6.1.6.2

The LLS designated SRVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the LLS function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.4 overlaps this SR to provide complete testing of the safety function.

Insert 2

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

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

REFERENCES

1. UFSAR, Section 5.2.2.5.

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

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

BASES

ACTIONS (continued)

E.1

With two lines with one or more vacuum breakers inoperable for opening, the primary containment boundary is intact. However, in the event of a containment depressurization, the function of the vacuum breakers is lost. Therefore, all vacuum breakers in one line must be restored to OPERABLE status within 1 hour. This Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, which requires that primary containment be restored to OPERABLE status within 1 hour.

F.1 and F.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.1.7.1

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

actual differential pressure are not considered as failing this SR.

SR 3.6.1.7.2

Each vacuum breaker must be cycled to ensure that it opens properly to perform its design function and returns to its fully closed position. This ensures that the safety analysis assumptions are valid. ~~The 31 day Frequency of this SR was developed based upon Inservice Testing Program requirements to perform valve testing at least once every 92 days. A 31 day Frequency was chosen to provide additional assurance that the vacuum breakers are OPERABLE.~~

Insert 2

SR 3.6.1.7.3

Insert 2

Demonstration of vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of ≤ 0.5 psid is valid. This verification may be performed by measurement of the equivalent force to move the pullet. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.~~

REFERENCES

1. UFSAR, Section 6.2.

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

BASES

ACTIONS (continued)

D.1 and D.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.1.8.1

Each vacuum breaker is verified closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker position indication or by verifying that a differential pressure of 0.5 psid between the suppression chamber and drywell is maintained for 1 hour without makeup. However, if vacuum breaker position indication is not reliable, either due to: 1) dual or open indication while able to establish a torus-to-drywell differential pressure, or 2) closed indication while not able to establish a torus-to-drywell differential pressure, alternate methods of verifying that the vacuum breaker is closed are detailed in Technical Requirements Manual (TRM).

If position indication appears reliable (dual or open indication while torus-to-drywell differential pressure is steady at 0 psid), and indicates open, the alternate methods outlined in the TRM can prove the indication to be in error and the vacuum breaker closed. However, in this case the vacuum breaker is assumed open until otherwise proved to satisfy the leakage test, and this confirmation must be performed within the Technical Specification 3.6.1.8 Required Action B.1 Completion Time of 2 hours. ~~The 7 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.~~

Insert 2

Notes 1 and 2 are added to this SR which allows suppression chamber-to-drywell vacuum breakers opened in conjunction with the performance of a Surveillance or open while performing their intended function to not be considered as failing this SR. These periods do not represent inoperable vacuum breakers.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.8.2

Each vacuum breaker must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This ensures that the safety analysis assumptions are valid. The Frequency of "prior to entering MODE 2 or 3 from MODE 4 if not performed in the previous 92 days" is based upon the demonstrated reliability of the vacuum breakers and the potential for the test to result in a stuck open vacuum breaker, which could be caused by a failure of the pneumatically operated test mechanism. Since the vacuum breaker is inaccessible in MODES 1, 2, and 3, test induced inoperability would result in a forced shutdown of the unit. In addition, there exists substantial redundancy in that 4 vacuum breakers must fail to open before the safety function is lost. In addition, this functional test is required within 12 hours after a discharge of steam to the suppression chamber from the safety/relief valves. Performing this test concurrent with an evolution or event that has the potential for admitting steam to the suppression chamber (e.g., during Low-Low Set operation of the SRVs) could distract the operators from the recovery evolution that would be in progress, and could lead to equipment damage. Therefore, the frequency of 12 hours after a discharge of steam to the suppression chamber begins when the evolution or event that has the potential for admitting steam to the suppression chamber ends (e.g., after completion of the Low-Low Set operation).

SR 3.6.1.8.3

Insert 2

Verification of the vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of 0.5 psid is valid. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency has also been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.~~

BASES

ACTIONS (continued)

E.1 and E.2

If suppression pool average temperature cannot be maintained at ≤ 120°F, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the reactor pressure must be reduced to < 200 psig within 12 hours and the plant must be brought to at least 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.

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

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1.1

Insert 2

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

REFERENCES

1. UFSAR, Section 6.2.
2. UFSAR, Section 15.1.4.

BASES

ACTIONS (continued)

Drywell Spray System. Therefore, continued operation for a limited time is allowed. The 2 hour Completion Time is sufficient to restore suppression pool water level to within limits. Also, it takes into account the low probability of an event impacting the suppression pool water level occurring during this interval.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2.1

Insert 2

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

REFERENCES

1. UFSAR, Section 6.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

Insert 2

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

SR 3.6.2.3.2

Verifying that each required RHR pump develops a flow rate ≥ 9,250 gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME Code, Section XI (Ref. 3). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

REFERENCES

1. UFSAR, Section 6.2.

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

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

BASES

ACTIONS (continued)

that are required to comply with ACTIONS or that are part of a shutdown of the unit.

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

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1

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

Insert 2

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

SR 3.6.2.4.2

Verifying each RHR pump develops a flow rate ≥ 500 gpm while operating in the suppression pool spray mode with flow through the heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by Section XI of the ASME Code (Ref. 3). This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY,

BASES

ACTIONS (continued)

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1.1

Insert 2

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

REFERENCES

1. UFSAR, Section 6.2.5.

BASES

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.1

Insert 2

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

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

SR 3.6.4.1.2 and SR 3.6.4.1.3

Verifying that secondary containment equipment hatches, pressure relief doors, railroad bay access doors, and one access door in each access opening are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the secondary containment will not occur. In this application, the term "sealed" has no connotation of leak tightness. Maintaining secondary containment OPERABILITY requires verifying one door in each access opening is closed. An access opening contains one inner and one outer door. In some cases, secondary containment access openings are shared such that a secondary containment barrier may have multiple inner or multiple outer doors. The intent is not to breach the secondary containment at any time when secondary containment is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times. However,

BASES

SURVEILLANCE REQUIREMENTS (continued) Insert 2

all secondary containment access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. ~~The 31 day Frequency for these SRs has been shown to be adequate, based on operating experience, and is considered adequate in view of the other indications of door and hatch status that are available to the operator.~~

A Note is added to SR 3.6.4.1.2 to allow a secondary containment railroad bay access door to be open for up to 4 hours for entry, exit or testing, and up to 12 hours for new fuel receipt activities. These activities do not indicate a problem with a railroad bay access door and the door should not be considered inoperable. Also, with one railroad bay door remaining closed, secondary containment OPERABILITY is maintained. The times allowed are reasonable for the activities being performed considering the availability of the redundant door.

SR 3.6.4.1.4

If the steam tunnel blowout panels are open the integrity of the Secondary Containment is lost. Since the steam tunnel blowout panels are inaccessible during plant operation, this SR is only required to be performed during MODE 4, but only if it has been greater than 31 days since the last verification. This frequency has been shown to be adequate based on operating experience, and in view of other indications of the status of the steam tunnel blowout panels available to the operator.

SR 3.6.4.1.5 and SR 3.6.4.1.6

The SGT System exhausts the secondary containment atmosphere to the environment through appropriate treatment equipment. To ensure that all fission products are treated, SR 3.6.4.1.5 verifies that the SGT System will rapidly establish and maintain a pressure in the secondary containment that is less than the lowest postulated pressure external to the secondary containment boundary. This is confirmed by demonstrating that one SGT subsystem will draw down the secondary containment to ≥ 0.25 inches of vacuum water gauge in ≤ 12 minutes. This cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.6 demonstrates that one SGT subsystem can

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

maintain ≥ 0.25 inches of vacuum water gauge for 1 hour at a flow rate ≤ 3000 cfm. The 1 hour test period allows secondary containment to be in thermal equilibrium at steady state conditions. Therefore, these two tests are used to ensure secondary containment boundary integrity. Since these SRs are secondary containment tests, they need not be performed with each SGT subsystem. ~~The SGT subsystems are tested on a STAGGERED TEST BASIS, however, to ensure that in addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

REFERENCES

1. UFSAR, Section 15.6.5.

2. UFSAR, Section 15.7.4.

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

BASES

ACTIONS (continued)

containment must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be immediately initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

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

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

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

Insert 2

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

Two Notes have been added to this SR. The first Note applies to valves and blind flanges located in high radiation areas and allows them to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted during

BASES

SURVEILLANCE REQUIREMENTS (continued)

MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these SCIVs, once they have been verified to be in the proper position, is low.

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

SR 3.6.4.2.2

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

SR 3.6.4.2.3

Verifying that each automatic SCIV closes on a secondary containment isolation signal is required to prevent leakage of radioactive material from secondary containment following a DBA or other accidents. This SR ensures that each automatic SCIV will actuate to the isolation position on a secondary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert 2

REFERENCES

1. UFSAR, Section 15.6.5.
2. UFSAR, Section 15.7.4.
3. Technical Requirements Manual.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem from the control room with flow through the HEPA filters and charcoal adsorbers for ≥ 15 continuous minutes ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action.

Insert 2

~~The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.~~

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The SGT System filter tests are in accordance with Regulatory Guide 1.52 (Ref. 4). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

Insert 2

SR 3.6.4.3.3

This SR verifies that each SGT subsystem starts and associated dampers open on receipt of an actual or simulated initiation signal. ~~While this Surveillance can be performed with the reactor at power, operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function. Therefore, the Frequency was found to be acceptable from a reliability standpoint.~~

Insert 2

SR 3.6.4.3.4

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

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

Insert 2

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

REFERENCES

1. UFSAR, Section 9.2.5.
2. UFSAR, Chapter 6.
3. UFSAR, Chapter 9.
4. UFSAR, Chapter 15.
5. UFSAR, Section 6.3.2.14.
6. NEDC-32988-A, Revision 2, Technical Justification to Support Risk- Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS (continued)

D.1 and D.2

If the EECW/EESW subsystem cannot be restored to OPERABLE status within the associated Completion Time, or both EECW/EESW subsystems are inoperable for reasons other than Condition A, or the UHS is determined inoperable for reasons other than Conditions A and B, such as not meeting the combined water volume or average water temperature requirement, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies the water level in each RHR reservoir to be sufficient for the proper reservoir heat removal capability and long-term cooling capability (net positive suction head and pump vortexing are considered in determining this limit). If each reservoir meets the 25 foot level limit (which equates to a water volume of 2,990,000 gal or 580 ft elevation) then the average reservoir level is known to be met without also doing a specific calculation. If either reservoir does not meet the water level requirement, that reservoir is inoperable. Verification of the UHS combined water volume is required to assess the OPERABILITY of the entire UHS. This ensures that the heat removal capability of the UHS is within the assumptions of the long-term cooling analysis. ~~The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.~~

Insert 2

SR 3.7.2.2

Verification of the average water temperature in each reservoir, both individually and combined, ensures that the heat removal capability of the reservoirs and UHS are within the assumptions of the long-term cooling analysis. ~~The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.3

Operating each cooling tower fan from the control room on both fast speed and slow speed, each for ≥ 15 minutes, ensures that all fans are OPERABLE and that all associated controls are functioning properly. It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. ~~The 31 day Frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the cooling tower fans occurring between surveillances.~~ Insert 2

This SR is modified by a Note stating that testing at fast speed is not required during icing conditions. This allowance is as a result of manufacturer recommendations, due to increased stress caused by ice on the fan blades. Icing conditions exist when ambient temperatures are ≤ 36°F and water is being returned to the cooling towers from RHRSW, EDG service water, or EESW.

SR 3.7.2.4

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

This SR also applies to the RHR Reservoir cross-connect valves. These valves are normally aligned such that each cross-tie line between the reservoirs has at least one valve open, provided any closed valve(s) are OPERABLE for opening. With closed cross-connect valve(s) incapable of being remote-manually cross-connected (i.e., inoperable), the continued OPERABILITY of both reservoirs for the long term cooling function may be maintained by de-energizing open both cross-connect valves in one cross-tie line.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

Insert 2

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

SR 3.7.2.5

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

Insert 2

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

REFERENCES

1. UFSAR, Chapter 9.
2. UFSAR, Chapter 4.
3. UFSAR, Chapter 6.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that a subsystem in a standby mode starts from the control room on demand and continues to operate. Standby systems should be checked periodically to ensure that they start and function properly. ~~As the environmental and normal operating conditions of this system are not severe, testing each subsystem once every month provides an adequate check on this system.~~ Operation with the heaters on for ≥ 15 continuous minutes demonstrates OPERABILITY of the system. Periodic operation ensures that heater failure, blockage, fan or motor failure, or excessive vibration can be detected for corrective action. ~~Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.~~

Insert 2

SR 3.7.3.2

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

The Note for this SR provides an allowance to delay entry into the associated Conditions and Required Actions for up to 6 hours in MODES 1, 2, and 3. This allowance prevents intentional entry into LCO 3.0.3 that would otherwise be caused by tests required by the VFTP. The tests that may be required while operating in MODE 1, 2, or 3 are: 1) the periodic charcoal sample; and 2) tests and samples required after exposing the filtration system to ventilation from painting, fire, or chemical release. Other VFTP required surveillances can be scheduled when the plant is not operating in MODE 1, 2, or 3.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.3.3

This SR verifies that on an actual or simulated initiation signal, each CREF subsystem starts, isolation valves close within 5 seconds, and operates. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.6 overlaps this SR to provide complete testing of the safety function. ~~The frequency of 18 months is based on industry operating experience and is consistent with the typical refueling cycle.~~

Insert 2

SR 3.7.3.4

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

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the CRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the CRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 8) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 9). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 10). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the CRE boundary has been restored to OPERABLE status.

BASES

ACTIONS (continued)

E.1 and E.2

The Required Actions of Condition E are modified by a Note indicating that LCO 3.0.3 does not apply. If moving recently irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of recently irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

During movement of recently irradiated fuel assemblies in the secondary containment or during OPDRVs, if Required Actions B.1 and B.2 cannot be met within the required Completion Times, action must be taken to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, handling of recently irradiated fuel in the secondary containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SR 3.7.4.1

Insert 2

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load. The SR consists of a verification of the control room temperature. ~~The 12 hour Frequency is appropriate since significant degradation of the Control Center AC System is not expected over this time period.~~

REFERENCES

1. UFSAR, Section 6.4.
2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk- Informed Modification to Selected Required End States for BWR Plants, December 2002.
3. UFSAR, Section 9.4.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1 and SR 3.7.5.2

This SR~~, on a 31 day Frequency,~~ requires an isotopic analysis of an offgas sample to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-135, Xe-138, Kr-85, Kr-87, and Kr-88. If the measured rate of radioactivity increases significantly (by ≥ 50% after correcting for expected increases due to changes in THERMAL POWER), an isotopic analysis is also performed within 4 hours after the increase is noted, to ensure that the increase is not indicative of a sustained increase in the radioactivity rate. ~~The 31 day Frequency is adequate in view of other instrumentation that continuously monitor the offgas, and is acceptable, based on operating experience.~~

Insert 2

SR 3.7.5.1 is modified by a Note indicating that the SR is not required to be performed until 31 days after any main steam line is not isolated and the SJAE is in operation. Only in this condition can radioactive fission gases be in the Main Condenser Offgas System at significant rates.

REFERENCES

1. UFSAR, Section 15.7.1.

2. 10 CFR 100.

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

BASES

ACTIONS (continued)

specified in the COLR, are not applied, the assumptions of the design basis transient analysis may not be met. Under such circumstances, prompt action should be taken to restore the Main Turbine Bypass System and Moisture Separator Reheater to OPERABLE status or adjust the MCPR limits accordingly. The 2 hour Completion Time is reasonable, based on the time to complete the Required Action and the low probability of an event occurring during this period requiring the Main Turbine Bypass System and/or Moisture Separator Reheater.

B.1

If the Main Turbine Bypass System and Moisture Separator Reheater cannot be restored to OPERABLE status or the MCPR limits for an inoperable Main Turbine Bypass System and/or Moisture Separator Reheater are not applied, THERMAL POWER must be reduced to < 25% RTP. As discussed in the Applicability section, operation at < 25% RTP results in sufficient margin to the required limits, and the Main Turbine Bypass System and Moisture Separator Reheater are not required to protect fuel integrity during rapid pressurization transients. The 4 hour Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1 and SR 3.7.6.2

Insert 2

Cycling each main turbine bypass valve through at least 5% of full travel demonstrates that the valves are mechanically OPERABLE and will function when required. ~~The 120 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Operating experience has shown that these components usually pass the SR when performed at the 92 day Frequency, and a sensitivity study shows that they will pass the SR when performed at the 120 day Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ SR 3.7.6.2, which cycles each main turbine bypass valve through one complete cycle of full travel, is performed after each entry into MODE 4, since this will not affect operating conditions, and will provide added assurance of valve OPERABILITY.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.6.3

Insert 2

The Main Turbine Bypass System and Moisture Separator Reheater are required to actuate automatically to perform its design function. This SR demonstrates that, with the required system initiation signals, the valves will actuate to their required position. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the 18 month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.~~

SR 3.7.6.4

Insert 2

This SR ensures that the TURBINE BYPASS SYSTEM RESPONSE TIME is in compliance with the assumptions of the appropriate safety analysis. The response time limits are specified in the Technical Requirements Manual. ~~The 18 month Frequency is based on~~ the ~~need to perform this Surveillance under the conditions that apply during a unit outage and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown the 18 month Frequency, which is based on the refueling cycle, is acceptable from a reliability standpoint.~~

REFERENCES

1. UFSAR, Section 7.7.1.4.
2. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

Insert 2

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

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 15.7.4.
3. 10 CFR 100.
4. NUREG-0800, Section 15.7.4, Revision 1, July 1981.
5. Regulatory Guide 1.25, March 1972.
6. UFSAR, Section 15.7.4.1.1.
7. 10 CFR 50.67
8. Regulatory Guide 1.183, June 2000.

BASES

APPLICABILITY

The requirements for OPERABILITY of the EDGSW subsystems are governed by the required OPERABILITY of the EDGs (LCO 3.8.1, "AC Sources – Operating," and LCO 3.8.2, "AC Sources – Shutdown").

ACTIONS

A.1

If one or more EDGSW subsystems are inoperable, the OPERABILITY of the associated EDG(s) is affected due to loss of its cooling source. The EDG(s) cannot perform its intended function and must be immediately declared inoperable. In accordance with LCO 3.0.6, this also requires entering into the Applicable Conditions and Required Actions for LCO 3.8.1 or LCO 3.8.2.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

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

Insert 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.2

This SR ensures that each EDGSW subsystem pump will automatically start to provide required cooling to the EDG when the EDG starts.

Insert 2

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

REFERENCES

1. UFSAR, Section 9.2.5.
2. UFSAR, Chapter 6.
3. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This value is also bounding for Division II and ensures that adequate voltage is available to the equipment supported by Division I and II of the EDGs. The specified maximum steady state output voltage of 4580 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the EDG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations found in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1

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

Insert 2

SR 3.8.1.2 and SR 3.8.1.7

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

To minimize the mechanical stress and wear on moving parts that do not get lubricated when the engine is not running, these SRs have been modified by a Note (Note 1 for SR 3.8.1.2 and the Note for SR 3.8.1.7) to indicate that all EDG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup prior to loading.

BASES

SURVEILLANCE REQUIREMENTS (continued)

For the purposes of SR 3.8.1.2 testing, the EDGs are started anywhere from standby to hot conditions by using one of the following signals:

- Manual,
- Simulated loss-of-offsite power by itself,
- Simulated loss-of-offsite power in conjunction with an ESF actuation test signal, or
- An ESF actuation test signal by itself.

In order to reduce stress and wear on diesel engines, the EDG manufacturer recommends a modified start in which the starting speed of EDGs is limited, warmup is limited to this lower speed, and the EDGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 2, which is only allowed to satisfy SR 3.8.1.2 but are not applicable when performing SR 3.8.1.7.

SR 3.8.1.7 requires that~~, at a 184 day Frequency,~~ the EDG starts from standby conditions and achieves required voltage and frequency within 10 seconds. Standby conditions for an EDG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations. The 10 second start requirement supports the assumptions in the design basis LOCA analysis of UFSAR, Section 6.3 (Ref. 13). The 10 second start requirement is not applicable to SR 3.8.1.2. Since SR 3.8.1.7 does require a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. In addition to the SR requirements, the time for the EDG to reach steady state operation, unless the modified EDG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

Insert 2

~~The normal 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of EDG OPERABILITY, while minimizing degradation resulting from testing.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.3

This Surveillance provides assurance that the EDGs are capable of synchronizing and accepting greater than or equal to the equivalent of the maximum expected accident loads without the risk of overloading the EDG. The EDG is tested at approximately 90% of its continuous load rating, which provides margin to excessive EDG loading, while demonstrating the EDG capability to carry loads near the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the EDG is connected to the offsite source.

Although no power factor requirements are established by this SR, the EDG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while 1.0 is an operational limitation to ensure circulating currents are minimized. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain EDG OPERABILITY.

Insert 2

~~The normal 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3).~~

Note 1 modifies this Surveillance to indicate that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Note 2 modifies this Surveillance by stating that momentary transients (e.g., because of changing bus loads) do not invalidate this test. Similarly, momentary power factor transients outside the normal range do not invalidate the test.

Note 3 indicates that this Surveillance should be conducted on only one EDG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations.

SR 3.8.1.4

Insert 2

This SR provides verification that there is an adequate inventory of fuel oil in the day tank to support the EDG operation for a minimum of one hour at full load. The volume of fuel oil equivalent to one hour supply is 210 gallons.

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

SR 3.8.1.5

Periodic

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

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.6

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

The design of fuel transfer systems is such that pumps operate automatically in order to maintain an adequate volume of fuel oil in the day tank during or following EDG testing. ~~As such, a 31 day Frequency is appropriate, since proper operation of fuel transfer systems is an inherent part of EDG OPERABILITY.~~

Insert 2

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Each EDG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the EDG load response characteristics and capability to reject the largest single load while maintaining a specified margin to the overspeed trip. The largest single load for each EDG is a residual heat removal pump (1684 kW). This Surveillance may be accomplished by:

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

As required by IEEE-308 (Ref. 15), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower. This represents 66.75 Hz, equivalent to 75% of the difference between nominal speed and the overspeed trip setpoint.

Insert 2

~~The frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10)~~.

SR 3.8.1.9

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

Insert 2

~~The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10) and is intended to be consistent with expected fuel cycle lengths.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.10

As required by Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the EDG, including automatic start of the EDG cooling water pump. It further demonstrates the capability of the EDG to automatically achieve the required voltage and frequency within the specified time.

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

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

Insert 2

~~The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(1), takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note allowing EDG starts to be preceded by an engine prelube period. The reason for the Note is to minimize wear and tear on the EDGs during testing.

SR 3.8.1.11

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

Insert 2

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

This SR is modified by a Note allowing EDG starts to be preceded by an engine prelube period. The reason for the Note is to minimize wear and tear on the EDGs during testing.

SR 3.8.1.12

This Surveillance demonstrates that EDG non-critical protective functions (e.g., high jacket water temperature) are bypassed on an actual or simulated emergency start (LOCA or loss of offsite power) signal. The non-critical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The EDG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the EDG.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

SR 3.8.1.13

Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3), requires demonstration ~~once per 18 months~~ that the EDGs can start and run continuously at full load capability for an interval of not less than 24 hours—22 hours of which is at a load equivalent to the continuous rating of the EDG, and 2 hours of which is at a load equivalent to 110% of the continuous duty rating of the EDG. Fermi-2 has taken an exception to this requirement and performs the 22 hour run at approximately 90% of the continuous rating (2500 kW-2600 kW), and performs the 2 hour run at approximately the continuous rating (2800 kW-2900 kW). The EDG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

Although no power factor requirements are established by this SR, the EDG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. A load band is provided to avoid routine overloading of the EDG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain EDG OPERABILITY.

Insert 2

~~The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~

This Surveillance has been modified by a Note. The Note states that momentary transients due to changing bus loads do not invalidate this test.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.14

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the minimum required voltage and frequency within 10 seconds and maintain a steady state voltage and frequency range. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. ~~The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(5).~~ Insert 2

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

SR 3.8.1.15

As required by Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and load transfer from the EDG to the offsite source can be made and that the EDG can be returned to standby status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the EDG to restart and reload if a subsequent loss of offsite power occurs. The EDG is considered to be in standby status when the EDG is shutdown with the output breaker open, the load sequence timers are reset, and is able to restart and reload on a subsequent bus under voltage.

Insert 2

~~The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(6), and takes into consideration plant conditions desired to perform the Surveillance.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.16

Under accident conditions with loss of offsite power loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the EDGs due to high motor starting currents. The 10% load sequence time interval tolerance ensures that sufficient time exists for the EDG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

Insert 2

~~The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(2); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~

SR 3.8.1.17

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

This Surveillance demonstrates EDG operation, as discussed in the Bases for SR 3.8.1.10, during a loss of offsite power actuation test signal in conjunction with an ECCS initiation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the EDG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert 2

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

This SR is modified by a Note allowing EDG starts to be preceded by an engine prelube period. The reason for the Note is to minimize wear and tear on the EDGs during testing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

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

Insert 2

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

This SR is modified by a Note allowing EDG starts to be preceded by an engine prelube period. The reason for the Note is to minimize wear on the EDG during testing.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Sections 8.2 and 8.3.
3. Regulatory Guide 1.9.
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. Regulatory Guide 1.93.
7. Generic Letter 84-15.
8. NEDC-32988-A, Revision 2, Technical Justification to Support Risk- Informed Modification to Selected Required End States for BWR Plants, December 2002.
9. 10 CFR 50, Appendix A, GDC 18.
10. Regulatory Guide 1.108.
11. Regulatory Guide 1.93.
12. Deleted.
13. UFSAR, Section 6.3.
14. ASME Boiler and Pressure Vessel Code, Section XI.
15. IEEE Standard 308.

BASES

ACTIONS (continued)

A.1

In this Condition, the 7 day fuel oil supply for a required EDG is not available. However, the Condition is restricted to fuel oil level reductions that maintain at least a 6 day supply. The fuel oil level equivalent to a 6 day supply is 30,240 gallons. These circumstances may be caused by events such as:

a. Full load operation required for an inadvertent start while at minimum required level; or

b. Feed and bleed operations that may be necessitated by increasing particulate levels or any number of other oil quality degradations.

This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of the fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the EDG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

B.1

This Condition is entered as a result of a failure to meet the acceptance criterion for particulates in one or more required EDG storage tanks. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the diesel engine, since particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and since proper engine performance has been recently demonstrated ~~(within 31 days)~~, it is prudent to allow a brief period prior to declaring the associated EDG inoperable. The 7 day Completion Time allows for further evaluation, resampling, and re-analysis of the EDG fuel oil.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

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

SR 3.8.3.2

The tests of fuel oil prior to addition to the storage tank are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between sampling (and associated results) of new fuel and addition of new fuel oil to the storage tank to exceed 31 days. The tests, limits, and applicable ASTM Standards for the new fuel oil tests listed in the Emergency Diesel Generator Fuel Oil Testing Program of Specification 5.5 are as follows:

a. Sample the new fuel oil in accordance with ASTM D975-07B (Ref. 6);

b. Verify that the sample has an API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the suppliers certificate, or an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 or an API gravity at 60°F of ≥ 27° and ≤ 39° when tested in accordance with ASTM D1298-85 (Ref. 6). Also, verify in accordance with the tests specified in ASTM D975-07B (Ref. 6) a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point of ≥ 125°F; and

c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-86 or a water and sediment content within limits when tested in accordance with ASTM D975-07B (Ref. 6).

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO since the fuel oil is not added to the storage tanks.

Following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-07B (Ref. 6) are met for new fuel oil

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

to reflect the lowest value at which the five starts can be accomplished.

~~The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.~~

SR 3.8.3.4

Periodic

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

Insert 2

REFERENCES

1. UFSAR, Section 9.5.4.
2. Regulatory Guide 1.137.
3. ANSI N195, 1976.
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. ASTM Standards: D975-07B; D1298-85; D4176-86; D5452-00.
7. C2 010 US 1, Fairbanks Morse Skidded Heat Exchanger Cooled Diesel Generator Sets

BASES

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. ~~The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 7).~~

Insert 2

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each inter-cell and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The connection resistance limits procedurally established for this SR are no more than 20% above the resistance as measured during installation and not above the ceiling value established by the manufacturer. This provides conservative measures to assure the Technical Specification limit is not exceeded.

Insert 2

~~The Frequency for these inspections, which can detect conditions that can cause power losses due to resistance heating, is 92 days. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends~~.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.3

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

Insert 2

~~The 18 month Frequency is based on engineering judgement, taking into consideration the desired plant conditions to perform the Surveillance. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency is considered acceptable from a standpoint of maintaining reliability.~~

SR 3.8.4.4 and SR 3.8.4.5

Visual inspection and resistance measurements of inter-cell and terminal connections provides an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anti-corrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR, provided visible corrosion is removed during performance of this Surveillance.

The connection resistance limits procedurally established for this SR are no more than 20% above the resistance as measured during installation, and not above the ceiling value established by the manufacturer. This provides conservative measures to assure the Technical Specification limit is not exceeded.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Insert 2

~~The 18 month Frequency is based on engineering judgement, taking into consideration the desired plant conditions to perform the Surveillance. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency is considered acceptable from a standpoint of maintaining reliability.~~

SR 3.8.4.6

Battery charger capability requirements are based on the design capacity of the chargers (Ref. 3). According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

Insert 2

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

SR 3.8.4.7

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

Insert 2

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

This SR is modified by a Note that allows the performance of a performance discharge test in lieu of a service test ~~once per 60 months~~.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.8

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

The battery performance discharge test is acceptable for satisfying SR 3.8.4.7 as noted in SR 3.8.4.7.

The acceptance criteria for this Surveillance is consistent with IEEE-450 (Ref. 7) and IEEE-485 (Ref. 11). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements.

Insert 2

~~The Frequency for this test is normally 60 months.~~ If the battery shows degradation, or if the battery has reached 85% of its expected life, the Surveillance Frequency is reduced to 18 months. Degradation is indicated, according to IEEE-450 (Ref. 7), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is 10% below the manufacturer's rating. ~~The 60 month Frequency is consistent with the recommendations in IEEE-450 (Ref. 7); however,~~ the 18 month Frequency is based on previously accepted industry practice, and the need to perform this test during an outage.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance.

BASES

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6.
3. IEEE Standard 308, 1978.
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. Regulatory Guide 1.93.
7. IEEE Standard 450.
8. NEDC-32988-A, Revision 2, Technical Justification to Support Risk- Informed Modification to Selected Required End States for BWR Plants, December 2002.
9. Regulatory Guide 1.32, February 1977.
~~10. Regulatory Guide 1.129, December 1974.~~
11. IEEE Standard 485, 1983.
12. UFSAR, Section 8.3.2.

BASES

APPLICABILITY

The battery cell parameters are required solely for the support of the associated DC electrical power subsystem. Therefore, battery electrolyte is only required when the DC power source is required to be OPERABLE. Refer to the Applicability discussions in Bases for LCO 3.8.4 and LCO 3.8.5.

ACTIONS

A.1, A.2, and A.3

With parameters of one or more cells in one or more batteries not within limits (i.e., Category A limits not met or Category B limits not met, or Category A and B limits not met) but within the Category C limits specified in Table 3.8.6-1, the battery is degraded but there is still sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of Category A or B limits not met, and continued operation is permitted for a limited period.

The pilot cell electrolyte level and float voltage are required to be verified to meet the Category C limits within 1 hour (Required Action A.1). This check provides a quick indication of the status of the remainder of the battery cells. One hour provides time to inspect the electrolyte level and to confirm the float voltage of the pilot cells. One hour is considered a reasonable amount of time to perform the required verification.

Verification that the Category C limits are met (Required Action A.2) provides assurance that during the time needed to restore the parameters to the Category A and B limits, the battery is still capable of performing its intended function. A period of 24 hours is allowed to complete the initial verification because specific gravity measurements must be obtained for each connected cell. Taking into consideration both the time required to perform the required verification and the assurance that the battery cell parameters are not severely degraded, this time is considered reasonable. The verification is repeated at 7 day intervals until the parameters are restored to Category A and B limits. ~~This periodic verification is consistent with the normal frequency of pilot cell Surveillances.~~

BASES

ACTIONS (continued)

Continued operation is only permitted for 31 days before battery cell parameters must be restored to within Category A and B limits. Taking into consideration that, while battery capacity is degraded, sufficient capacity exists to perform the intended function and to allow time to fully restore the battery cell parameters to normal limits, this time is acceptable for operation prior to declaring the DC batteries inoperable.

B.1

When any battery parameter is outside the Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not ensured and the corresponding DC electrical power subsystem must be declared inoperable. Additionally, other potentially extreme conditions, such as not completing the Required Actions of Condition A within the required Completion Time or average electrolyte temperature of representative cells falling below 60°F, also are cause for immediately declaring the associated DC electrical power subsystem inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 3), which recommends regular battery inspections ~~(at least one per month)~~ including voltage, specific gravity, and electrolyte temperature of pilot cells.

Insert 2

SR 3.8.6.2

Insert 2

The ~~quarterly~~ inspection of specific gravity and voltage is consistent with IEEE-450 (Ref. 3). In addition, within 24 hours of a battery discharge < 105 V or a battery overcharge > 145 V, the battery must be demonstrated to meet Category B limits. Transients, such as motor starting transients, which may momentarily cause battery voltage to drop to ≤ 105 V, do not constitute a battery discharge provided the battery terminal voltage and float current

BASES

SURVEILLANCE REQUIREMENTS (continued)

return to pre-transient values. This inspection is also consistent with IEEE-450 (Ref. 3), which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge.

SR 3.8.6.3

This Surveillance verification that the average temperature of representative cells (i.e., selection of 10 connected cells) is within limits is consistent with a recommendation of IEEE-450 (Ref. 3) that states that the temperature of electrolytes in representative cells should be determined ~~on a quarterly basis~~.

Insert 2

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on manufacturer's recommendations.

Table 3.8.6-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designed pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage, and electrolyte specific gravity approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer's recommendations and are consistent with the guidance in IEEE-450 (Ref. 3), with the extra ¼ inch allowance above the high water level indication for operating margin to account for temperature and charge effects. In addition to this allowance, footnote (a) to Table 3.8.6-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

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

Insert 2

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

3. Regulatory Guide 1.93, December 1974.

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

BASES

ACTIONS (continued)

required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. In many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made, (i.e., to suspend CORE ALTERATIONS, movement of recently irradiated fuel assemblies in the secondary containment, and any activities that could result in inadvertent draining of the reactor vessel).

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the plant safety systems.

Notwithstanding performance of the above conservative Required Actions, a required residual heat removal-shutdown cooling (RHR-SDC) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the RHR-SDC ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring RHR-SDC inoperable and not in operation, which results in taking the appropriate RHR-SDC ACTIONS.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the plant safety systems may be without power.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the AC and DC electrical power distribution subsystem is functioning properly, with the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. ~~The~~

Insert 2

BASES

SURVEILLANCE REQUIREMENTS (Continued)

~~7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, as well as other indications available in the control room that alert the operator to subsystem malfunctions.~~

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

Insert 2

~~The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel.~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. UFSAR, Section 7.6.1.
3. UFSAR, Section 15.4.1.1.
4. UFSAR, Section 15.4.1.1.2.2.

BASES

ACTIONS

A.1 and A.2

With the refueling position one-rod-out interlock inoperable, the refueling interlocks may not be capable of preventing more than one control rod from being withdrawn. This condition may lead to criticality.

Control rod withdrawal must be immediately suspended, and action must be immediately initiated to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Action must continue until all such control rods are fully inserted. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and, therefore, do not have to be inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

Proper functioning of the refueling position one-rod-out interlock requires the reactor mode switch to be in Refuel. During control rod withdrawal in MODE 5, improper positioning of the reactor mode switch could, in some instances, allow improper bypassing of required interlocks. Therefore, this Surveillance imposes an additional level of assurance that the refueling position one-rod-out interlock will be OPERABLE when required. By "locking" the reactor mode switch in the proper position (i.e., removing the reactor mode switch key from the console while the reactor mode switch is positioned in refuel), an additional administrative control is in place to preclude operator errors from resulting in unanalyzed operation.

Insert 2

~~The Frequency of 12 hours is sufficient in view of other administrative controls utilized during refueling operations to ensure safe operation.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.9.2.2

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated refuel position one-rod-out interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. ~~The 7 day Frequency is considered adequate because of demonstrated circuit reliability, procedural controls on control rod withdrawals, and visual and audible indications available in the control room to alert the operator to control rods not fully inserted.~~ To perform the required testing, the applicable condition must be entered (i.e., a control rod must be withdrawn from its full-in position). Therefore, SR 3.9.2.2 has been modified by a Note that states the CHANNEL FUNCTIONAL TEST is not required to be performed until 1 hour after any control rod is withdrawn.

Insert 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. UFSAR, Section 7.6.1.1.
3. UFSAR, Section 15.4.1.1.

BASES

LCO

All control rods must be fully inserted during applicable refueling conditions to minimize the probability of an inadvertent criticality during refueling.

APPLICABILITY

During MODE 5, loading fuel into core cells with control rods withdrawn may result in inadvertent criticality. Therefore, the control rods must be inserted before loading fuel into a core cell. All control rods must be inserted before loading fuel to ensure that a fuel loading error does not result in loading fuel into a core cell with the control rod withdrawn.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and no fuel loading activities are possible. Therefore, this Specification is not applicable in these MODES.

ACTIONS

A.1

With all control rods not fully inserted during the applicable conditions, an inadvertent criticality could occur that is not analyzed in the UFSAR. All fuel loading operations must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

During refueling, to ensure that the reactor remains subcritical, all control rods must be fully inserted prior to and during fuel loading. Periodic checks of the control rod position ensure this condition is maintained.

Insert 2

~~The 12 hour Frequency takes into consideration the procedural controls on control rod movement during refueling as well as the redundant functions of the refueling interlocks.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2

During MODE 5, the OPERABILITY of control rods is primarily required to ensure a withdrawn control rod will automatically insert if a signal requiring a reactor shutdown occurs. Because no explicit analysis exists for automatic shutdown during refueling, the shutdown function is satisfied if the withdrawn control rod is capable of automatic insertion and the associated CRD scram accumulator pressure is ≥ 940 psig.

Insert 2

~~The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.~~

SR 3.9.5.1 is modified by a Note that allows 7 days after withdrawal of the control rod to perform the Surveillance. This acknowledges that the control rod must first be withdrawn before performance of the Surveillance, and therefore avoids potential conflicts with SR 3.0.3 and SR 3.0.4.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. UFSAR, Section 15.4.1.1.
3. UFSAR, Section 15.4.1.1.2.2.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 20 ft 6 inches above the top of the RPV flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in secondary containment (Ref. 2).

Insert 2

~~The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely.~~

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.
2. UFSAR, Section 15.7.4.
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.11.
5. UFSAR, Section 9.1.2.2.1.
6. Regulatory Guide 1.183, June 2000.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

This Surveillance demonstrates that the RHR shutdown cooling subsystem is capable of decay heat removal.

The verification includes assuring that the shutdown cooling subsystem is capable of taking suction from the reactor vessel and discharging back to the reactor vessel through an RHR heat exchanger with available cooling water. This SR does not require any testing or valve manipulation, rather, it involves verification that those valves not locked, sealed, or otherwise secured in the correct position, can be aligned to the correct position for shutdown cooling operation. ~~The Frequency of 12 hours is sufficient in view of the procedural controls on valve positioning.~~

Insert 2

REFERENCES

None.

BASES

ACTIONS (continued)

OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

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

If no RHR subsystem and no recirculation pump is in operation, immediate action must be initiated to restore either an RHR subsystem or a recirculation pump to operation. In addition, an alternate method of coolant circulation is required to be established within 1 hour. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.

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

SURVEILLANCE REQUIREMENTS

SR 3.9.8.1

This Surveillance demonstrates that one RHR shutdown cooling subsystem or one 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.

Insert 2

~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystems and recirculation pump in the control room.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.9.8.2

This Surveillance demonstrates that the RHR shutdown cooling subsystem is capable of decay heat removal. The verification includes assuring that the shutdown cooling subsystem is capable of taking suction from the reactor vessel and discharging back to the reactor vessel through an RHR heat exchanger with available cooling water. This SR does not require any testing or valve manipulation, rather, it involves verification that those valves capable of being mispositioned are in the correct position.

Insert 2

~~The Frequency of 12 hours is sufficient in view of the procedural controls on valve positioning.~~

REFERENCES None.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1 and SR 3.10.2.2

Meeting the requirements of this Special Operations LCO maintains operation consistent with or conservative to operating with the reactor mode switch in the shutdown position (or the refuel position for MODE 5). The functions of the reactor mode switch interlocks that are not in effect, due to the testing in progress, are adequately compensated for by the Special Operations LCO requirements. The administrative controls are to be periodically verified to ensure that the operational requirements continue to be met. ~~The Surveillances performed at the 12 hour and 24 hour Frequencies are intended to provide appropriate assurance that operating personnel are aware of and verify compliance with these Special Operations LCO requirements.~~

Insert 2

REFERENCES

1. UFSAR, Chapter 7.
2. UFSAR, Section 15.4.1.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.3.1, SR 3.10.3.2, and SR 3.10.3.3

The other LCOs made applicable in this Special Operations LCO are required to have their Surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed (electrically or hydraulically) while the scram function for the withdrawn rod is not available, periodic verification in accordance with SR 3.10.3.2 is required to preclude the possibility of criticality. SR 3.10.3.2 has been modified by a Note, which clarifies that this SR is not required to be met if SR 3.10.3.1 is satisfied for LCO 3.10.3.d.1 requirements, since SR 3.10.3.2 demonstrates that the alternative LCO 3.10.3.d.2 requirements are satisfied. Also, SR 3.10.3.3 verifies that all control rods other than the control rod being withdrawn are fully inserted. ~~The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawal, the protection afforded by the LCOs involved, and hardwire interlocks that preclude additional control rod withdrawals.~~

Insert 2

REFERENCES

1. UFSAR, Section 15.4.1.1.

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

If one or more of the requirements of this Special Operations LCO are not met with the affected control rod not insertable, withdrawal of the control rod and removal of the associated CRD must be immediately suspended. If the CRD has been removed, such that the control rod is not insertable, the Required Actions require the most expeditious action be taken to either initiate action to restore the CRD and insert its control rod, or initiate action to restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.4.1, SR 3.10.4.2, SR 3.10.4.3, and SR 3.10.4.4

The other LCOs made applicable by this Special Operations LCO are required to have their associated surveillances met to establish that this Special Operations LCO is being met. If the local array of control rods is inserted and disarmed (electrically or hydraulically) while the scram function for the withdrawn rod is not available, periodic verification is required to ensure that the possibility of criticality remains precluded. Verification that all the other control rods are fully inserted is required to meet the SDM requirements. Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the affected control rod. ~~The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardwire interlocks to preclude an additional control rod withdrawal.~~

Insert 2

SR 3.10.4.2 and SR 3.10.4.4 have been modified by Notes, which clarify that these SRs are not required to be met if the alternative requirements demonstrated by SR 3.10.4.1 are satisfied.

REFERENCES

1. UFSAR, Section 15.4.1.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.5.1, SR 3.10.5.2, SR 3.10.5.3, SR 3.10.5.4, and SR 3.10.5.5

Verification that all the control rods, other than the control rod withdrawn for the removal of the associated CRD, are fully inserted is required to ensure the SDM is within limits. Verification that the local five by five array of control rods, other than the control rod withdrawn for removal of the associated CRD, is inserted and disarmed (electrically or hydraulically), while the scram function for the withdrawn rod is not available, is required to ensure that the possibility of criticality remains precluded. The Surveillance for LCO 3.1.1, which is made applicable by this Special Operations LCO, is required in order to establish that this Special Operations LCO is being met. Verification that a control rod withdrawal block has been inserted and that no other CORE ALTERATIONS are being made is required to ensure the assumptions of the safety analysis are satisfied under conditions when position indication instrumentation is inoperable for the withdrawn control rod.

Insert 2

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. ~~The 24 hour Frequency is acceptable, given the administrative controls on control rod removal and hardwire interlock to block an additional control rod withdrawal.~~

REFERENCES

1. UFSAR, Section 15.4.1.1.

BASES

ACTIONS

A.1, A.2, A.3.1, and A.3.2

If one or more of the requirements of this Special Operations LCO are not met, the immediate implementation of these Required Actions restores operation consistent with the normal requirements for refueling (i.e., all control rods inserted in core cells containing one or more fuel assemblies) or with the exceptions granted by this Special Operations LCO. An additional conservative requirement is imposed to suspend loading fuel assemblies. The Completion Times for Required Action A.1, Required Action A.2, Required Action A.3.1, and Required Action A.3.2 are intended to require that these Required Actions be implemented in a very short time and carried through in an expeditious manner to either initiate action to restore the affected CRDs and insert their control rods, or initiate action to restore compliance with this Special Operations LCO.

SURVEILLANCE REQUIREMENTS

SR 3.10.6.1 and SR 3.10.6.2

Insert 2

Periodic verification of the administrative controls established by this Special Operations LCO is prudent to preclude the possibility of an inadvertent criticality. ~~The 24 hour Frequency is acceptable, given the administrative controls on fuel assembly and control rod removal, and takes into account other indications of control rod status available in the control room.~~

REFERENCES

1. UFSAR, Section 15.4.1.1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

verification (i.e., SR 3.10.7.3) must be performed during control rod movement to prevent deviations from the specified sequence. These surveillances provide adequate assurance that the specified test sequence is being followed.

SR 3.10.7.4

Insert 2

Periodic verification that no CORE ALTERATIONS are in progress will ensure that the reactor is operated within the bounds of the safety analysis. ~~The 12 hour Frequency is intended to provide appropriate assurance that operating personnel are aware of and verify compliance with these Special Operations LCO requirements.~~

SR 3.10.7.5

Coupling verification is performed to ensure the control rod is connected to the control rod drive mechanism and will perform its intended function when necessary. The verification is required to be performed any time a control rod is withdrawn to the "full-out" notch position, and prior to withdrawing it for the purpose of performing this Special Operation after work on the control rod or CRD System that could affect coupling. This Frequency is acceptable, considering the low probability that a control rod will become uncoupled when it is not being moved as well as operating experience related to uncoupling events.

SR 3.10.7.6

CRD charging water header pressure verification is performed to ensure the motive force is available to scram the control rods in the event of a scram signal. A minimum accumulator pressure is also specified (in LCO 3.9.5), below which the capability of the accumulator to perform its intended function becomes degraded and the accumulator is considered inoperable. The minimum charging water header pressure of 940 psig is well below the expected pressure of 1100 psig. ~~The 7 day Frequency has been shown to be acceptable through operating experience and takes into account indications available in the control room.~~

Insert 2

Enclosure 5 to
NRC-14-0065

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

Technical Specification Cross-Reference for Fermi 2 and TSTF 425 Mark-ups

Technical Specification Cross-Reference for TSTF-425 and Fermi 2 Mark-ups

Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Reactivity Anomalies	----------	**3.1.2**
Verify core reactivity	----------	3.1.2.1
Control Rod Operability	**3.1.3**	**3.1.3**
Determine control rod position	3.1.3.1	3.1.3.1
Perform notch test - fully withdrawn control rod one notch	3.1.3.2	----------
Perform notch test - withdrawn control rod one notch	3.1.3.3	3.1.3.2
Control Rod Scram Times	**3.1.4**	**3.1.4**
Perform scram time testing	3.1.4.2	3.1.4.2
Control Rod Scram Accumulators	**3.1.5**	**3.1.5**
Verify control rod scram accumulator pressure	3.1.5.1	3.1.5.1
Rod Pattern Control	**3.1.6**	**3.1.6**
Verity control rods comply with withdrawal sequence	3.1.6.1	3.1.6.1
SLC System	**3.1.7**	**3.1.7**
Verify volume of sodium pentaborate	3.1.7.1	3.1.7.1
Verify temperature of sodium pentaborate	3.1.7.2	3.1.7.2
Verify temperature of pump suction piping	3.1.7.3	3.1.7.3
Verify continuity of explosive charge	3.1.7.4	3.1.7.4
Verify concentration of boron solution	3.1.7.5	3.1.7.5
Verify manual/power operated valve position	3.1.7.6	3.1.7.6
Verify pump flow rate	3.1.7.7	3.1.7.7**
Verify flow through one SLC subsystem	3.1.7.8	3.1.7.8
Verify heat traced piping is unblocked	3.1.7.9	3.1.7.9
SDV Vent and Drain Valve	**3.1.8**	**3.1.8**
Verify each SDV vent & drain valve open	3.1.8.1	3.1.8.1
Cycle each SDV vent & drain valve fully closed/open position	3.1.8.2	----------
Verify each SDV vent & drain valve closes on receipt of scram	3.1.8.3	3.1.8.2
APLHGR	**3.2.1**	**3.2.1**
Verify APLHGR less than or equal to limits	3.2.1.1	3.2.1.1
MCPR	**3.2.2**	**3.2.2**
Verify MCPR greater than or equal to the limits	3.2.2.1	3.2.2.1
LHGR	**3.2.3**	**3.2.3**
Verify LHGR less than or equal to limits	3.2.3.1	3.2.3.1
APRM Gain and Setpoints	**3.2.4**	----------
Verify MFLPD is within limits	3.2.4.1	----------
Verify APRM setpoints or gains are adjusted for calculated MFLPD	3.2.4.2	----------
RPS Instrumentation	**3.3.1.1**	**3.3.1.1**
Perform Channel Check	3.3.1.1.1	3.3.1.1.1
Perform Channel Check	----------	3.3.1.1.2
Verify absolute diff. between APRM channels & calculated power	3.3.1.1.2	3.3.1.1.3
Adjust channel to conform to calibrated flow	3.3.1.1.3	----------

Technical Specification Cross-Reference for TSTF-425 and Fermi 2 Mark-ups

Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Perform Channel Functional Test (12 hours after entering Mode 2)	3.3.1.1.4	3.3.1.1.4
Perform Channel Functional Test	3.3.1.1.5	3.3.1.1.5
Verify IRM and APRM overlap	----------	3.3.1.1.7
Calibrate the local power range monitors	3.3.1.1.6	3.3.1.1.8
Perform Channel Functional Test	3.3.1.1.7	3.3.1.1.9
Verify the trip unit setpoint	3.3.1.1.8	3.3.1.1.10
Perform Channel Calibration	3.3.1.1.9	3.3.1.1.12
Perform Channel Functional Test	3.3.1.1.10	3.3.1.1.13
Perform Channel Calibration	3.3.1.1.11	3.3.1.1.11
Verify the APRM Flow Biased Simulated Thermal Power	3.3.1.1.12	----------
Perform Channel Calibration	----------	3.3.1.1.14
Perform Logic System Functional Test	3.3.1.1.13	3.3.1.1.15
Verify Turbine Stop Valve - Closure	3.3.1.1.14	3.3.1.1.16
Verify the RPS Response Time is within limits	3.3.1.1.15	3.3.1.1.17
Perform Channel Calibration	----------	3.3.1.1.18
Perform Logic System Functional Test	----------	3.3.1.1.19
Verify OPRM is not bypassed	----------	3.3.1.1.20
SRM Instrumentation	**3.3.1.2**	**3.3.1.2**
Perform Channel Check	3.3.1.2.1	3.3.1.2.1
Verify an Operable SRM detector	3.3.1.2.2	3.3.1.2.2
Perform Channel Check	3.3.1.2.3	3.3.1.2.3
Verify count rate	3.3.1.2.4	3.3.1.2.4
Perform Channel Functional Test	3.3.1.2.5	3.3.1.2.5
Perform Channel Functional Test (12 hours after IRMs on Range 2)	3.3.1.2.6	3.3.1.2.6
Perform Channel Calibration	3.3.1.2.7	3.3.1.2.7
Control Rod Block Instrumentation	**3.3.2.1**	**3.3.2.1**
Perform Channel Functional Test	3.3.2.1.1	3.3.2.1.3
Perform Channel Functional Test (1 hour after in Mode 2)	3.3.2.1.2	3.3.2.1.1
Perform Channel Functional Test (1 hour after in Mode 1)	3.3.2.1.3	3.3.2.1.2
Verify the RBM	3.3.2.1.4	3.3.2.1.5
Verify the RWM	3.3.2.1.5	----------
Perform Channel Functional Test (1 hour after shutdown position)	3.3.2.1.6	3.3.2.1.4
Perform Channel Calibration	3.3.2.1.7	3.3.2.1.6
Feedwater & Main Turbine High Water Level Trip Instrument	**3.3.2.2**	**3.3.2.2**
Perform Channel Check	3.3.2.2.1	3.3.2.2.1
Perform Channel Functional Test	3.3.2.2.2	3.3.2.2.2
Perform Channel Calibration	3.3.2.2.3	3.3.2.2.3
Perform Logic System Functional Test	3.3.2.2.4	3.3.2.2.4
PAM Instrumentation	**3.3.3.1**	**3.3.3.1**
Perform Channel Check	3.3.3.1.1	3.3.3.1.1

Technical Specification Cross-Reference for TSTF-425 and Fermi 2 Mark-ups

Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Perform Channel Calibration	3.3.3.1.2	3.3.3.1.2
Remote Shutdown System	**3.3.3.2**	**3.3.3.2**
Perform Channel Check	3.3.3.2.1	3.3.3.2.1
Verify each required control circuit and transfer switch	3.3.3.2.2	3.3.3.2.2
Perform Channel Calibration	3.3.3.2.3	3.3.3.2.3
EOC-RPT Instrumentation	**3.3.4.1**	----------
Perform Channel Functional Test	3.3.4.1.1	----------
Calibrate the trip units	3.3.4.1.2	----------
Perform Channel Calibration	3.3.4.1.3	----------
Perform logic System Functional Test	3.3.4.1.4	----------
Verify TSV, TCV, Trip Oil Pressure are not bypassed	3.3.4.1.5	----------
Verify the EOC-RPT System Response Time is within limits	3.3.4.1.6	----------
Determine RPT breaker interruption time	3.3.4.1.7	----------
ATWS-RPT Instrumentation	**3.3.4.2**	**3.3.4.1**
Perform channel check	3.3.4.2.1	3.3.4.1.1
Perform channel functional test	3.3.4.2.2	3.3.4.1.2
Calibrate the trip units	3.3.4.2.3	----------
Perform channel calibration	3.3.4.2.4	3.3.4.1.3
Perform logic system functional test	3.3.4.2.5	3.3.4.1.4
ECCS Instrumentation	**3.3.5.1**	**3.3.5.1**
Perform channel check	3.3.5.1.1	3.3.5.1.1
Perform channel functional test	3.3.5.1.2	3.3.5.1.2
Calibrate the trip unit	3.3.5.1.3	3.3.5.1.3
Perform channel calibration	3.3.5.1.4	----------
Perform channel calibration	3.3.5.1.5	3.3.5.1.4
Perform logic system functional test	3.3.5.1.6	3.3.5.1.5
Perform Channel Functional Test	----------	3.3.5.1.6
Verify the ECCS Response time is within limits	3.3.5.1.7	----------
RCIC System Instrumentation	**3.3.5.2**	**3.3.5.2**
Perform channel check	3.3.5.2.1	3.3.5.2.1
Perform channel functional test	3.3.5.2.2	3.3.5.2.2
Calibrate the trip units	3.3.5.2.3	3.3.5.2.3
Perform channel calibration	3.3.5.2.4	----------
Perform channel calibration	3.3.5.2.5	3.3.5.2.4
Perform logic system functional test	3.3.5.2.6	3.3.5.2.5
Perform Channel Functional Test	----------	3.3.5.2.6
Primary Containment Isolation Instrumentation	**3.3.6.1**	**3.3.6.1**
Perform channel check	3.3.6.1.1	3.3.6.1.1
Perform channel functional test	3.3.6.1.2	3.3.6.1.2
Calibrate the trip unit	3.3.6.1.3	3.3.6.1.3

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Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Perform channel calibration	3.3.6.1.4	3.3.6.1.4
Perform channel functional test	3.3.6.1.5	3.3.6.1.6
Perform channel calibration	3.3.6.1.6	----------
Perform logic system functional test	3.3.6.1.7	3.3.6.1.5
Verify isolation system response time is within limits	3.3.6.1.8	3.3.6.1.7
Secondary Containment Isolation Instrumentation	**3.3.6.2**	**3.3.6.2**
Perform channel check	3.3.6.2.1	3.3.6.2.1
Perform channel functional test	3.3.6.2.2	3.3.6.2.2
Calibrate the trip unit	3.3.6.2.3	3.3.6.2.3
Perform channel calibration	3.3.6.2.4	----------
Perform channel calibration	3.3.6.2.5	3.3.6.2.4
Perform logic system functional test	3.3.6.2.6	3.3.6.2.5
Verify the isolation system response time is within limits	3.3.6.2.7	----------
LLS Instrumentation	**3.3.6.3**	**3.3.6.3**
Perform channel check	3.3.6.3.1	----------
Perform channel functional test for portion (outside)	3.3.6.3.2	3.3.6.3.2
Perform channel functional test for portion (inside)	3.3.6.3.3	----------
Perform channel functional test	3.3.6.3.4	3.3.6.3.1
Calibrate the trip unit	3.3.6.3.5	----------
Perform channel calibration	3.3.6.3.6	3.3.6.3.3
Perform logic system functional test	3.3.6.3.7	3.3.6.3.4
MCREC / CREF System Instrumentation	**3.3.7.1**	**3.3.7.1**
Perform channel check	3.3.7.1.1	3.3.7.1.1
Perform channel functional test	----------	3.3.7.1.2
Perform channel functional test	3.3.7.1.2	3.3.7.1.3
Calibrate the trip units	3.3.7.1.3	3.3.7.1.4
Perform channel calibration	3.3.7.1.4	3.3.7.1.5
Perform logic system functional test	3.3.7.1.5	3.3.7.1.6
LOP Instrumentation	**3.3.8.1**	**3.3.8.1**
Perform channel check	3.3.8.1.1	----------
Perform channel functional test	3.3.8.1.2	3.3.8.1.1
Perform channel calibration	3.3.8.1.3	3.3.8.1.2
Perform logic system functional test	3.3.8.1.4	3.3.8.1.3
RPS Electric Power Monitoring	**3.3.8.2**	**3.3.8.2**
Perform channel functional test	3.3.8.2.1	3.3.8.2.1
Perform channel calibration	3.3.8.2.2	3.3.8.2.2
Perform a system functional test	3.3.8.2.3	3.3.8.2.3
Recirculation Loops Operating	**3.4.1**	**3.4.1**
Verify recirculation loop jet pump flow mismatch	3.4.1.1	3.4.1.1
Jet Pumps	**3.4.2**	**3.4.2**

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Verify for each circulation loop	3.4.2.1	3.4.2.1
SRVs	**3.4.3**	**3.4.3**
Verify the safety function lift setpoints of the SRVs	3.4.3.1	3.4.3.1**
Verify each required SRV opens when manually actuated	3.4.3.2	3.4.3.2
RCS Operational LEAKAGE	**3.4.4**	**3.4.4**
Verify RCS unidentified and total/unidentified leakage	3.4.4.1	3.4.4.1
RCS PIV Leakage	**3.4.5**	**3.4.5**
Verify equivalent leakage of each RCS PIV	3.4.5.1	3.4.5.1**
RCS Leakage Detection Instrumentation	**3.4.6**	**3.4.6**
Perform a channel check	3.4.6.1	3.4.6.1
Perform a channel functional test	3.4.6.2	3.4.6.2
Perform a channel calibration	3.4.6.3	3.4.6.3
RCS Specific Activity	**3.4.7**	**3.4.7**
Verify reactor coolant DOSE EQUIVALENT I-131	3.4.7.1	3.4.7.1
RHR Shutdown Cooling System - Hot Shutdown	**3.4.8**	**3.4.8**
Verify one RHR shutdown cooling subsystem	3.4.8.1	3.4.8.1
RHR Shutdown Cooling System - Cold Shutdown	**3.4.9**	**3.4.9**
Verify one RHR shutdown cooling subsystem	3.4.9.1	3.4.9.1
RCS P/T Limits	**3.4.10**	**3.4.10**
Verify RCS pressure, temperature, heatup/cooldown (PTLR)	3.4.10.1	3.4.10.1
Verify reactor vessel flange and head flange (PTLR)(tensioning)	3.4.10.7	3.4.10.7
Verify reactor vessel flange and head flange (PTLR)(30 min.)	3.4.10.8	3.4.10.8
Verify reactor vessel flange and head flange (PTLR)(MODE 4)	3.4.10.9	3.4.10.9
Reactor Steam Dome Pressure	**3.4.11**	**3.4.11**
Verify reactor steam dome pressure	3.4.11.1	3.4.11.1
ECCS - Operating	**3.5.1**	**3.5.1**
Verify correct voltage and breaker alignment	----------	3.5.1.1
Perform a functional test of the LPCI swing bus	----------	3.5.1.2
Verify for each ECCS injection/spray subsystem the piping	3.5.1.1	3.5.1.3
Verify each ECCS injection/spray subsystem manual, power	3.5.1.2	3.5.1.4
Verify ADS air supply header pressure	3.5.1.3	3.5.1.5
Verify the RHR System cross tie valve is closed	3.5.1.4	----------
Verify the RHR System cross tie valve is open	----------	3.5.1.6
Verify each LPCI Inverter output voltage	3.5.1.5	----------
Verify each recirculation pump discharge valve	----------	3.5.1.7
Verify the following ECCS pumps develop specified flow rate	3.5.1.7	3.5.1.8**
Verify reactor pressure and HPCI pump can develop flow rate	3.5.1.8	3.5.1.9**
Verify reactor pressure and HPCI pump can develop flow rate	3.5.1.9	3.5.1.10
Verify each ECCS injection/spray subsystem actuates	3.5.1.10	3.5.1.11
Verify the ADS actuates on an actual or simulated signal	3.5.1.11	3.5.1.12

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Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Verify ADS valve is capable of being opened	3.5.1.12	3.5.1.13
Verify ECCS Response Time is within limits	----------	3.5.1.14
ECCS - Shutdown	**3.5.2**	**3.5.2**
Verify the suppression pool water level	3.5.2.1	3.5.2.1
Verify for each required core spray (CS) subsystem	3.5.2.2	3.5.2.2
Verify correct voltage and breaker alignment	----------	3.5.2.3
Verify the piping is filled with water	3.5.2.3	3.5.2.4
Verify each required ECCS injection/spray subsystem position	3.5.2.4	3.5.2.5
Verify each required ECCS pump develops flow rate	3.5.2.5	3.5.2.6**
Verify each required ECCS injection/spray subsystem actuates	3.5.2.6	3.5.2.7
RCIC System	**3.5.3**	**3.5.3**
Verify the RCIC System piping is filled with water	3.5.3.1	3.5.3.1
Verify each RCIC System manual, power, automatic	3.5.3.2	3.5.3.2
Verify the RCIC pump can develop a flow rate	3.5.3.3	3.5.3.3
Verify the RCIC pump can develop a flow rate	3.5.3.4	3.5.3.4
Verify the RCIC System actuates on signal	3.5.3.5	3.5.3.5
Primary Containment	**3.6.1.1**	**3.6.1.1**
Verify drywell to suppression chamber differential pressure	3.6.1.1.2	3.6.1.1.2
Primary Containment Air Lock	**3.6.1.2**	**3.6.1.2**
Verify only one door in the primary containment air lock	3.6.1.2.2	3.6.1.2.2
PCIVs	**3.6.1.3**	**3.6.1.3**
Verify each 18 inch primary containment purge valve is sealed	3.6.1.3.1	----------
Verify each 18 inch primary containment purge valve is closed	3.6.1.3.2	3.6.1.3.1
Verify primary containment isolation manual valve (outside)	3.6.1.3.3	3.6.1.3.2
Verify continuity of TIP shear isolation valve explosive charge	3.6.1.3.5	3.6.1.3.4
Verify isolation time of each power operated automatic PCIV	3.6.1.3.6	3.6.1.3.5**
Perform leakage rate testing for primary containment purges	3.6.1.3.7	3.6.1.3.6
Verify the isolation time of each MSIV	3.6.1.3.8	3.6.1.3.7**
Verify each automatic PCIV actuates to isolation position	3.6.1.3.9	3.6.1.3.8
Verify reactor instrumentation line EFCV	3.6.1.3.10	3.6.1.3.9
Remove and test the explosive squib	3.6.1.3.11	3.6.1.3.10
Verify each [ ] inch primary containment purge valve is blocked	3.6.1.3.15	----------
Drywell / Primary Containment Pressure	**3.6.1.4**	**3.6.1.4**
Verify pressure is within limit	3.6.1.4.1	3.6.1.4.1
Drywell Air Temperature	**3.6.1.5**	**3.6.1.5**
Verify drywell average air temperature is within limit	3.6.1.5.1	3.6.1.5.1
LLS Valves	**3.6.1.6**	**3.6.1.6**
Verify each LLS valve opens when manually actuated	3.6.1.6.1	3.6.1.6.1
Verify the LLS System actuates on a signal	3.6.1.6.2	3.6.1.6.2
Reactor Building-to-Suppression Chamber Vacuum Breakers	**3.6.1.7**	**3.6.1.7**

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Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Verify each vacuum breaker is closed	3.6.1.7.1	3.6.1.7.1
Perform a functional test of each vacuum breaker	3.6.1.7.2	3.6.1.7.2
Verify the opening setpoint of each vacuum breaker	3.6.1.7.3	3.6.1.7.3
Suppression Chamber-to-Drywell Vacuum Breakers	**3.6.1.8**	**3.6.1.8**
Verify each vacuum breaker is closed	3.6.1.8.1	3.6.1.8.1
Perform a functional test of each required vacuum breaker	3.6.1.8.2	----------
Verify the opening setpoint of each required vacuum breaker	3.6.1.8.3	3.6.1.8.3
MSIV LCS	**3.6.1.9**	----------
Operate each MSIV LCS blower	3.6.1.9.1	----------
Verify electrical continuity of each inboard MSIV LCS subsystem	3.6.1.9.2	----------
Perform a system functional test of each MSIV LCS subsystem	3.6.1.9.3	----------
Suppression Pool Average Temperature	**3.6.2.1**	**3.6.2.1**
Verify suppression pool average temperature is within limits	3.6.2.1.1	3.6.2.1.1
Suppression Pool Water Level	**3.6.2.2**	**3.6.2.2**
Verify suppression pool water level is within limits	3.6.2.2.1	3.6.2.2.1
RHR Suppression Pool Cooling	**3.6.2.3**	**3.6.2.3**
Verify each RHR suppression pool cooling subsystem	3.6.2.3.1	3.6.2.3.1
Verify each RHR pump develops a flow rate	3.6.2.3.2	3.6.2.3.2**
RHR Suppression Pool Spray	**3.6.2.4**	**3.6.2.4**
Verify each RHR suppression pool spray subsystem	3.6.2.4.1	3.6.2.4.1
Verify each RHR pump develops a flow rate	3.6.2.4.2	3.6.2.4.2**
Drywell-to-Suppression Chamber Differential Pressure	**3.6.2.5**	----------
Verify drywell-to-suppression chamber differential pressure	3.6.2.5.1	----------
Drywell Cooling System Fans	**3.6.3.1**	----------
Operate each required drywell cooling system fan	3.6.3.1.1	----------
Verify each required drywell cooling system fan flow rate	3.6.3.1.2	----------
Primary Containment Oxygen Concentration	**3.6.3.2**	**3.6.3.1**
Verify primary containment oxygen concentration is within limits	3.6.3.2.1	3.6.3.1.1
CAD System	**3.6.3.3**	----------
Verify liquid nitrogen is contained in the CAD System	3.6.3.3.1	----------
Verify each CAD subsystem manual, power, and automatic	3.6.3.3.2	----------
Secondary Containment	**3.6.4.1**	**3.6.4.1**
Verify secondary containment vacuum	3.6.4.1.1	3.6.4.1.1
Verify all secondary containment equipment hatches are closed	3.6.4.1.2	3.6.4.1.2
Verify one secondary containment access door is closed	3.6.4.1.3	3.6.4.1.3
Verify secondary containment can be drawn down	3.6.4.1.4	3.6.4.1.5
Verify the secondary containment can be maintained	3.6.4.1.5	3.6.4.1.6
SCIVs	**3.6.4.2**	**3.6.4.2**
Verify each secondary containment isolation manual valve	3.6.4.2.1	3.6.4.2.1
Verify the isolation time of each power operated, auto SCIV	3.6.4.2.2	3.6.4.2.2**

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Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Verify each automatic SCIV actuates to the isolation position	3.6.4.2.3	3.6.4.2.3
SGT System	**3.6.4.3**	**3.6.4.3**
Operate each SGT subsystem with heaters operating	3.6.4.3.1	3.6.4.3.1
Verify each SGT subsystem actuates	3.6.4.3.3	3.6.4.3.3
Verify each SGT filter cooler bypass damper can be opened	3.6.4.3.4	3.6.4.3.4
RHRSW System	**3.7.1**	**3.7.1**
Verify each RHRSW manual, power , and automatic valve	3.7.1.1	3.7.1.1
PSW / EECW/EESW System and UHS	**3.7.2**	**3.7.2**
Verify the water level of each PSW cooling tower basin	3.7.2.1	3.7.2.1
Verify the water level of each PSW pump well of the intake	3.7.2.2	----------
Verify the average water temperature of UHS	3.7.2.3	3.7.2.2
Operate each PSW cooling tower fan	3.7.2.4	3.7.2.3
Verify each PSW subsystem manual, power, and automatic	3.7.2.5	3.7.2.4
Verify each PSW subsystem actuates	3.7.2.6	3.7.2.5
DG 1B SSW System	**3.7.3**	**3.7.8**
Verify each DG 1B SSW System manual, power, automatic	3.7.3.1	3.7.8.1
Verify the DG 1B SSW System pump starts automatically	3.7.3.2	3.7.8.2
MCREC / CREF System	**3.7.4**	**3.7.3**
Operate each MCREC subsystem	3.7.4.1	3.7.3.1
Verify each MCREC subsystem actuates	3.7.4.3	3.7.3.3
Verify MCREC subsystem can maintain a positive pressure	3.7.4.4	----------
Control Room AC System	**3.7.5**	**3.7.4**
Verify each control room AC subsystem can remove heat load	3.7.5.1	----------
Verify control room air temperature	----------	3.7.4.1
Main Condenser Offgas	**3.7.6**	**3.7.5**
Verify the gross gamma activity rate of the noble gasses	3.7.6.1	3.7.5.1
Main Turbine Bypass and Moisture Separator Reheator System	**3.7.7**	**3.7.6**
Verify one complete cycle of each main turbine bypass valve	3.7.7.1	----------
Verify each main turbine bypass valve opens at least 5%	----------	3.7.7.1
Perform a system functional test	3.7.7.2	3.7.6.3
Verify the turbine bypass system response time	3.7.7.3	3.7.6.4
Spent Fuel Storage Pool Water Level	**3.7.8**	**3.7.7**
Verify the spent fuel storage pool water level	3.7.8.1	3.7.7.1
AC Sources - Operating	**3.8.1**	**3.8.1**
Verify correct breaker alignment and indicated power availability	3.8.1.1	3.8.1.1
Verify each DG starts	3.8.1.2	3.8.1.2
Verify each DG is synchronized and loaded and operates	3.8.1.3	3.8.1.3
Verify each day tank contains fuel oil	3.8.1.4	3.8.1.4
Check for and remove accumulated water from each day tank	3.8.1.5	3.8.1.5
Verify the fuel oil transfer system operates to transfer fuel oil	3.8.1.6	3.8.1.6

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Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Verify each DG starts from standby conditions	3.8.1.7	3.8.1.7
Verify automatic and manual transfer of unit power supply	3.8.1.8	----------
Verify each DG rejects a load	3.8.1.9	3.8.1.8
Verify each DG does not trip and voltage is maintained	3.8.1.10	3.8.1.9
Verify on simulated loss of offsite power signal	3.8.1.11	3.8.1.10
Verify on actual or simulated ECCS signal each DG auto-start	3.8.1.12	3.8.1.11
Verify each DG's automatic trips are bypassed	3.8.1.13	3.8.1.12
Verify each DG operates	3.8.1.14	3.8.1.13
Verify each DG starts and achieves steady state voltage	3.8.1.15	3.8.1.14
Verify each DG synchronizes, transfers	3.8.1.16	3.8.1.15
Verify a DG operating in test mode an ECCS signal overrides	3.8.1.17	----------
Verify interval between each sequences load block	3.8.1.18	3.8.1.16
Verify de-energization, load shedding, and DG auto-start	3.8.1.19	3.8.1.17
Verify DG achieves voltage and frequency	3.8.1.20	3.8.1.18
Diesel Fuel Oil and Starting Air	**3.8.3**	**3.8.3**
Verify each fuel oil storage tank contains fuel	3.8.3.1	3.8.3.1
Verify lube oil inventory	3.8.3.2	----------
Verify each DG air start receiver pressure	3.8.3.4	3.8.3.3
Check for and remove accumulated water from each fuel tank	3.8.3.5	3.8.3.4
DC Sources - Operating	**3.8.4**	**3.8.4**
Verify battery terminal voltage	3.8.4.1	3.8.4.1
Verify each required battery charger	3.8.4.2	3.8.4.6
Verify battery capacity is adequate	3.8.4.3	3.8.4.7
Verify battery terminals and connecters	----------	3.8.4.2
Verify battery cells, cell plates, and racks show no damage	----------	3.8.4.3
Remove visible corrosion and verify anti-corrosion material	----------	3.8.4.4
Verify battery connection resistance	----------	3.8.4.5
Verify Battery capacity during discharge test	----------	3.8.4.8
Battery Parameters	**3.8.6**	----------
Verify each battery float current	3.8.6.1	----------
Verify each battery Pilot cell voltage	3.8.6.2	----------
Verify each battery connected cell electrolyte level	3.8.6.3	----------
Verify each battery pilot cell temperature	3.8.6.4	----------
Verify each battery connected cell voltage	3.8.6.5	----------
Verify battery capacity	3.8.6.6	----------
Inverters - Operating	**3.8.7**	----------
Verify correct inverter voltage, frequency, and alignment	3.8.7.1	----------
Inverters - Shutdown	**3.8.8**	----------
Verify correct inverter voltage, frequency, and alignment	3.8.8.1	----------
Battery Cell Parameters	----------	**3.8.6**

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Verify battery cell parameters (Category A)	----------	3.8.6.1
Verify battery cell parameters (Category B)	----------	3.8.6.2
Verify average electrolyte temperature	----------	3.8.6.3
Distribution Systems - Operating	**3.8.9**	**3.8.7**
Verify correct breaker alignments and voltage	3.8.9.1	3.8.7.1
Distribution Systems - Shutdown	**3.8.10**	**3.8.8**
Verify correct breaker alignments and voltage	3.8.10.1	3.8.8.1
Refueling Equipment Interlocks	**3.9.1**	**3.9.1**
Perform channel functional test	3.9.1.1	3.9.1.1
Refuel Position One-Rod-Out Interlock	**3.9.2**	**3.9.2**
Verify reactor mode switch locked in refuel position	3.9.2.1	3.9.2.1
Perform channel functional test	3.9.2.2	3.9.2.2
Control Rod Position	**3.9.3**	**3.9.3**
Verify all control rods are fully inserted	3.9.3.1	3.9.3.1
Control Rod OPERABILITY - Refueling	**3.9.5**	**3.9.5**
Insert each withdrawn control rod at least one notch	3.9.5.1	3.9.5.1
Verify each withdrawn control rod scram accumulator pressure	3.9.5.2	3.9.5.2
RPV Water Level - Irradiated Fuel	**3.9.6**	**3.9.6**
Verify RPV water level	3.9.6.1	3.9.6.1
RPV Water Level- New Fuel or Control Rods	**3.9.7**	**3.9.6**
Verify RPV water level	3.9.7.1	3.9.6.1
RHR - High Water Level	**3.9.8**	**3.9.7**
Verify RHR shutdown cooling subsystem	3.9.8.1	3.9.7.1
RHR - Low Water Level	**3.9.9**	**3.9.8**
Verify RHR shutdown cooling subsystem	3.9.9.1	3.9.8.1
Verify each RHR shutdown cooling subsystem	----------	3.9.8.2
Reactor Mode Switch Interlock Testing	**3.10.2**	**3.10.2**
Verify all control rods are fully inserted	3.10.2.1	3.10.2.1
Verify no Core Alterations are in progress	3.10.2.2	3.10.2.2
Single Control Rod Withdrawal - Hot Shutdown	**3.10.3**	**3.10.3**
Verify all control rods are disarmed	3.10.3.2	3.10.3.2
Verify all control rods are fully inserted	3.10.3.3	3.10.3.3
Single Control Rod Withdrawal - Cold Shutdown	**3.10.4**	**3.10.4**
Verify all control rods are disarmed	3.10.4.2	3.10.4.2
Verify all control rods are fully inserted	3.10.4.3	3.10.4.3
Verify a control rod withdrawal block is inserted	3.10.4.4	3.10.4.4
Single CRD Removal - Refueling	**3.10.5**	**3.10.5**
Verify all control rods are fully inserted	3.10.5.1	3.10.5.1
Verify all control rods are disarmed	3.10.5.2	3.10.5.2
Verify a control rod withdrawal block is inserted	3.10.5.3	3.10.5.3

Technical Specification Cross-Reference for TSTF-425 and Fermi 2 Mark-ups

Technical Specification Section Title/Surveillance Description*	TSTF-425	Fermi 2
Verify no Core Alterations are in progress	3.10.5.5	3.10.5.5
Multiple Control Rod Withdrawal - Refueling	**3.10.6**	**3.10.6**
Verify the four fuel assemblies are removed	3.10.6.1	3.10.6.1
Verify all other control rods in core cells are inserted	3.10.6.2	3.10.6.2
Verify fuel assemblies being loaded are in compliance	3.10.6.3	----------
SDM Test - Refueling	**3.10.8**	**3.10.7**
Verify no other Core Alterations are in progress	3.10.8.4	3.10.7.4
Verify CRD charging water header pressure	3.10.8.6	3.10.7.6
Recirculation Loops - Testing	**3.10.9**	----------
Verify LCO requirements	3.10.9.1	----------
Verify thermal power during physics test	3.10.9.2	----------
Training Startups	**3.10.10**	----------
Verify all operable IRM channels	3.10.10.1	----------
Verify average reactor coolant temperature	3.10.10.2	----------
T4803F601, Nitrogen Inerting Drywell Air Purge Inlet Supply Valve	----------	**3.10.8**
Verify penetration valves are closed and deactivated	----------	3.10.8.1
Perform leakage rate testing for primary containment purge	----------	3.10.8.2

* The Technical Specification (TS) Section Title/Surveillance Description of this Enclosure is a summary description of the referenced TSTF 425/Fermi 2 TS Surveillances which is provided for information purposes only and is not intended to be a verbatim description of the TS Surveillances.

** This Fermi 2 Surveillance Frequency is provided in the Fermi 2 Inservice Testing Program. This Fermi 2 Surveillance Frequency is not proposed for inclusion in the Surveillance Frequency Control Program.

Enclosure 6 to
NRC-14-0065

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

License Amendment Request to Revise Technical Specifications by Relocating Surveillance Frequencies to Licensee Control in Accordance with TSTF-425, Revision 3

Proposed No Significant Hazards Consideration

Proposed No Significant Hazards Consideration

Description of Amendment Request:

This amendment request involves the adoption of approved changes to the standard technical specifications (STS) for General Electric Plants, BWR/4 (NUREG-1433), to allow relocation of specific technical specification (TS) surveillance frequencies to a licensee controlled program. The proposed changes are described in Technical Specification Task Force (TSTF) Traveler, TSTF-425, Revision 3 (ADAMS Accession No. ML090850642), "Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b" and are described in the Notice of Availability published in the Federal Register on July 6, 2009 (74 FR 31996).

The proposed changes are consistent with NRC-approved Industry/TSTF Traveler, TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control-RITSTF Initiative 5b." The proposed changes relocate surveillance frequencies to a licensee controlled program, the Surveillance Frequency Control Program (SFCP). The changes are 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). In addition, administrative/editorial deviations of the TSTF-425 inserts and the existing TS wording are being proposed to fit the custom TS format.

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

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

Response: No.

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

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

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

Response: No.

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

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

3. Do the proposed changes involve a significant reduction in the margin of safety?

Response: No.

The design, operation, testing methods, and acceptance criteria for systems, structures, and components (SSCs), specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plant licensing basis (including the final safety analysis report and bases to 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, DTE Electric Company (DTE) will perform a probabilistic risk evaluation using the guidance contained in NRC approved NEI 04-10, Revision 1, in accordance with the TS SFCP. NEI 04-10, Revision 1, methodology provides reasonable acceptance guidelines and methods for evaluating the risk increase of proposed changes to surveillance frequencies consistent with Regulatory Guide 1.177.

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

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