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November 14, 2019
L-19-233

10 CFR 50.90

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

SUBJECT:
Davis-Besse Nuclear Power Station
Docket No. 50-346, License No. NPF-3
License Amendment Request for Adoption of TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b"

Pursuant to 10 CFR 50.90, FirstEnergy Nuclear Operating Company (FENOC) hereby submits an amendment application for the Davis-Besse Nuclear Power Station (DBNPS).

The proposed amendment would modify the DBNPS Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies." The changes are consistent with Nuclear Regulatory Commission (NRC)-approved Technical Specification Task Force (TSTF) Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b." However, certain deviations from TSTF-425 are proposed in FENOC's application. The deviations and an assessment of the proposed changes are provided in Enclosure A. Probabilistic risk assessment (PRA) technical adequacy documentation for DBNPS is provided in Enclosure B.

A cross-reference between the TSTF-425 affected standard TS pages and the DBNPS TS pages is provided for information only in the attachment to this letter.

To allow for normal NRC processing, FENOC requests approval of the proposed license amendment by December 30, 2020 and an implementation period of 120 days after the effective date of the amendment.

There are no regulatory commitments contained in this submittal. If there are any questions or additional information is required, please contact Mr. Phil H. Lashley, Acting Manager, FENOC Nuclear Licensing and Regulatory Affairs, at (330) 315-6808.

I certify under penalty of perjury that the foregoing is true and correct. Executed on November 14, 2019.

Sincerely,

Mark B. Bezilla

Enclosures:
A. FENOC Description and Assessment of the Proposed Amendment
B. Documentation of Davis-Besse PRA Technical Adequacy

Attachment:
TSTF-425 Versus Davis-Besse Nuclear Power Station (DBNPS) Cross-Reference

cc: NRC Region III Administrator
NRC Resident Inspector
NRR Project Manager
Utility Radiological Safety Board
Executive Director, Ohio Emergency Management Agency,
State of Ohio (NRC Liaison)

ENCLOSURE A

FENOC DESCRIPTION AND ASSESSMENT OF THE PROPOSED AMENDMENT

FENOC Description and Assessment of the Proposed Amendment

Subject: License Amendment Request for Adoption of TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b"

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Attachments:

1. Proposed Technical Specification Changes (Mark-Ups)
2. Proposed Technical Specification Bases Changes (Mark-Ups) – For Information Only

1.0 DESCRIPTION

The proposed amendment would modify the Davis-Besse Nuclear Power Station (DBNPS) technical specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the adoption of Technical Specification Task Force (TSTF)-425, Revision 3, ‘‘Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b.’’ Additionally, the change would add a new program, the Surveillance Frequency Control Program (SFCP), to TS Section 5.0, “Administrative Controls.”

The proposed changes are consistent with the Nuclear Regulatory Commission (NRC)-approved Industry/TSTF Standard Technical Specification (STS) change TSTF-425, Revision 3 (Accession No. ML090850642); however, FirstEnergy Nuclear Operating Company (FENOC) proposes certain variations and deviations from TSTF-425, Revision 3, for the proposed DBNPS amendment as discussed in Section 2.2, “Optional Changes and Variations.” The Federal Register notice published on July 6, 2009 (74 FR 31996) announced the availability of this TS improvement.

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

FENOC has reviewed the safety evaluation (SE) dated July 6, 2009 (74 FR 31996). This review included a review of the NRC staff’s evaluation, TSTF-425, Revision 3, and the requirements specified in Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," dated April 2007 (Accession No. ML071360456).

“Documentation of DBNPS Probabilistic Risk Assessment (PRA) Technical Adequacy” includes FENOC documentation with regard to PRA technical adequacy consistent with the requirements of Regulatory Guide 1.200, Revision 1, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities” (Accession No. ML070240001).

FENOC has concluded that the justifications presented in the TSTF proposal and the SE prepared by the NRC staff are applicable to the DBNPS and justify this amendment to incorporate the changes to the DBNPS TS.

2.2 Optional Changes and Variations

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

- Revised (clean) TS pages are not included in this amendment request given the number of TS pages affected, the straightforward nature of the proposed changes, and outstanding license amendment requests that may affect some of the same TS pages. Providing only mark-ups of the proposed TS changes satisfies the requirements of 10 CFR 50.90, “Application for amendment of license, construction permit, or early site permit,” in that the mark-ups fully describe the changes desired. This is 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 SE published in the same Federal Register Notice. As a result of this deviation, the contents and numbering of the

attachments for this amendment request differ from the attachments specified in the NRC staff's model application. This deviation is consistent with many other industry applications adopting TSTF-425.

- The insert provided in TSTF-425 for the TS Bases (Insert 2) states, "The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program." In a letter dated April 14, 2010 (Accession No. ML100990099), the NRC staff agreed that the insert applies to surveillance frequencies that are relocated and subsequently evaluated and changed in accordance with the SFCP but does not apply to frequencies relocated to the SFCP, but not changed. Therefore, the insert for the TS Bases is revised to, "The Surveillance Frequency is controlled under the Surveillance Frequency Control Program," or "The Surveillance Frequencies are controlled under the Surveillance Frequency Control Program," as appropriate. This is an administrative deviation from TSTF-425 with no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996). The existing TS Bases information describing the basis for the surveillance frequency will be relocated to the licensee-controlled SFCP.
- The definition of STAGGERED TEST BASIS is being retained in the DBNPS TS Section 1.1, "Definitions" because this term is used in Administrative TS Section 5.5.17, "Control Room Envelope Habitability Program." TS 5.5.17 is not affected by implementation of TSTF-425 and is not proposed to be changed. This is an administrative deviation from TSTF-425 with no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996).
- The TSTF-425 TS Section 5.5.18 insert references NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies." The proposed DBNPS TS Section 5.5.18 references NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies." This is an administrative deviation from TSTF-425 with no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996).
- The "TSTF-425 Versus Davis-Besse Nuclear Power Station (DBNPS) Cross-Reference" is provided for information and is a cross-reference between the NUREG-1430, "Standard Technical Specifications Babcock and Wilcox Plants," Surveillance Requirements (SRs) included in TSTF-425 versus the DBNPS SRs included in this amendment request. The cross-reference includes a summary description of the referenced TSTF-425 (NUREG-1430)/DBNPS TS SRs, which is provided for information purposes only and is not intended to be a verbatim description of the TS SRs. The cross-reference contains the following items:

  a) NUREG-1430 SRs included in TSTF-425 and corresponding DBNPS SRs with identical SR numbers

  b) NUREG-1430 SRs included in TSTF-425 and corresponding DBNPS SRs with differing SR numbers

  These are administrative variations from TSTF-425 with no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996).

  Some DBNPS SRs in a) and b) above may differ from the corresponding NUREG-1430 SR in equipment names, grammatical structure, additional descriptive information, units of measurement for a parameter, or other differences. These differences have been evaluated and determined not to impact the applicability of TSTF-425. These are

identified and discussed in the Notes column of the cross-reference table; are not considered deviations from TSTF-425, and therefore, have no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996). The DBNPS SRs with numbering that differs from the corresponding NUREG-1430 SRs are administrative variations from TSTF-425 with no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996).

c) NUREG-1430 SRs included in TSTF-425 that are not contained in the DBNPS TS

For NUREG-1430 SRs that are not contained in the DBNPS TS, the corresponding NUREG-1430 mark-ups included in TSTF-425 for these SRs are not applicable to DBNPS. These are administrative variations from TSTF-425 with no impact on the NRC staff's model SE dated July 6, 2009 (74 FR 31996).

d) DBNPS plant-specific SRs that are not contained in NUREG-1430, and therefore, are not included in the TSTF-425 mark-ups

The following SRs are DBNPS plant-specific and therefore considered variations from TSTF-425:

- 3.1.9, "Reactivity Control Systems – PHYSICS TEST Exceptions"
  - SR 3.1.9.2
- 3.3.14, "INSTRUMENTATION - Fuel Handling Exhaust – High Radiation"
  - SR 3.3.14.1
  - SR 3.3.14.2
  - SR 3.3.14.3
- 3.3.16, "INSTRUMENTATION – Anticipatory Reactor Trip System (ARTS)"
  - SR 3.3.16.1
  - SR 3.3.16.2
  - SR 3.3.16.3
- 3.4.5, "RCS Loops – MODE 3"
  - SR 3.4.5.2
- 3.4.6, "RCS Loops – MODE 4"
  - SR 3.4.6.2
- 3.4.12, "Low Temperature Overpressure Protection (LTOP) System"
  - SR 3.4.12.1
- 3.4.14, "RCS Pressure Isolation Valve (PIV) Leakage"
  - SR 3.4.14.1
  - SR 3.4.14.5
- 3.5.2, "ECCS – Operating"
  - SR 3.5.2.8
- 3.6.7, "Trisodium Phosphate Dodecahydrate (TSP) Storage System"
  - SR 3.6.7.1
- 3.7.3, "Main Feedwater Stop Valves (MFSVs), Main Feedwater Control Valves (MFCVs), and Associated Startup Feedwater Control Valves (SFCVs)"
  - SR 3.7.3.2

- 3.7.4, “Turbine Stop Valves (TSVs)”
  - SR 3.7.4.1
  - SR 3.7.4.2
- 3.7.5, “Emergency Feedwater (EFW) System”
  - SR 3.7.5.2
  - SR 3.7.5.3
  - SR 3.7.5.8
  - SR 3.7.5.9
  - SR 3.7.5.10

For the DBNPS plant-specific SRs identified above that are not contained in the mark-ups provided in TSTF-425, FENOC has determined that the relocation of the frequencies is consistent with the intent of TSTF-425, Revision 3, and with the NRC staff’s model SE dated July 6, 2009 (74 FR 31996), including the scope exclusions identified in Section 1.0, “Introduction,” of the model SE. These DBNPS plant-specific SRs involve fixed periodic frequencies and do not meet any of the four exclusion criteria of TSTF-425, Revision 3. The four criteria that exclude surveillance frequencies from being relocated are:

- Frequencies that reference other approved programs for the specific interval (such as the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program);
- Frequencies that are purely event driven (for example, “Each time the control rod is withdrawn to the ‘full out’ position”);
- Frequencies that are event-driven but have a time component for performing the surveillance on a one-time basis once the event occurs (for example, “within 24 hours after thermal power reaching ≥ 95% RTP”); and
- Frequencies that are related to specific conditions (for example, battery degradation, age, and capacity) or conditions for the performance of a surveillance requirement (for example, “drywell to suppression chamber differential pressure decrease”).

In accordance with TSTF-425, changes to the frequencies for SRs with periodic frequencies that do not meet the exclusion criteria would be controlled under the SFCP. The SFCP 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 SFCP would be evaluated using the methodology and probabilistic risk guidelines contained in NEI 04-10, Revision 1, as approved by NRC letter dated September 19, 2007 (Accession No. ML072570267). The NEI 04-10, Revision 1, methodology includes qualitative considerations, risk analyses, sensitivity studies and bounding analyses, as necessary, and recommended monitoring of the performance of systems, structures, and components (SSCs) for which frequencies are changed to assure that reduced testing does not adversely impact the SSCs. In addition, the NEI 04-10, Revision 1, methodology satisfies the five key safety principles specified in Regulatory Guide 1.177, “An Approach for Plant-Specific, Risk-Informed

Decisionmaking: Technical Specifications," dated August 1998, relative to changes in SR frequencies.

Relocation of these frequencies is consistent with TSTF-425, Revision 3, and with the NRC staff's model SE dated July 6, 2009 (74 FR 31996), including the scope exclusions identified in Section 1.0, "Introduction," of the model SE. These variations are identified and discussed in the Notes column of the cross-reference table.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration

FirstEnergy Nuclear Operating Company (FENOC) has reviewed the proposed no significant hazards consideration determination (NSHCD) published in the Federal Register dated July 6, 2009 (74 FR 31996). FENOC has concluded that the proposed NSHCD presented in the Federal Register notice is applicable to the Davis-Besse Nuclear Power Station and satisfies the requirements of 10 CFR 50.91(a). The NSHCD is provided below.

Description of Amendment Request:

This change request involves the adoption of an approved change to the standard technical specifications (STS) for Babcock and Wilcox Plants (NUREG-1430), to allow relocation of specific technical specifications (TS) surveillance frequencies to a licensee-controlled program. The proposed change is described in Technical Specification Task Force (TSTF) Traveler, TSTF-425, Revision 3 (Accession No. ML090850642), related to the Relocation of Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b and is described in the Notice of Availability published in the Federal Register on July 6, 2009 (74 FR 31996).

The proposed changes are consistent with Nuclear Regulatory Commission (NRC)-approved Industry/TSTF Traveler, TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b." The proposed change relocates surveillance frequencies to a licensee-controlled program, the Surveillance Frequency Control Program. This change is applicable to licensees using probabilistic risk guidelines contained in NRC-approved NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," (Accession No. ML071360456).

Basis for proposed no significant hazards consideration:

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

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

Response: No.

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

requirements, and be capable of performing any mitigation function assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly increased.

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

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

Response: No.

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

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

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

Response: No.

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

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

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

3.2 Applicable Regulatory Requirements

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

presented in the Federal Register notice is applicable to the Davis-Besse Nuclear Power Station.

3.3 Conclusions

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

4.0 ENVIRONMENTAL CONSIDERATION

FENOC has reviewed the environmental consideration included in the NRC's model safety evaluation published in the Federal Register on July 6, 2009 (74 FR 31996). FENOC has concluded that the NRC staff's findings presented in the published evaluation are applicable to Davis-Besse Nuclear Power Station and the determination is incorporated by reference for this application.

Attachment 1

Davis-Besse Nuclear Power Station

Proposed Technical Specification Changes (Mark-Ups)

The following lists the pages included within Attachment 1:

3.1.1-1	3.3.14-1	3.6.4-1	3.8.1-11
3.1.2-2	3.3.15-2	3.6.5-1	3.8.1-12
3.1.4-3	3.3.16-2	3.6.6-2	3.8.3-2
3.1.5-2	3.3.17-2	3.6.6-3	3.8.4-2
3.1.6-1	3.3.17-3	3.6.7-1	3.8.6-3
3.1.7-3	3.3.18-2	3.7.2-2	3.8.6-4
3.1.8-3	3.4.1-2	3.7.3-2	3.8.7-2
3.1.9-2	3.4.2-1	3.7.4-1	3.8.8-2
3.1.9-3	3.4.3-2	3.7.5-3	3.8.9-2
3.2.1-3	3.4.4-2	3.7.5-4	3.8.10-2
3.2.2-1	3.4.5-2	3.7.5-5	3.9.1-1
3.2.3-1	3.4.6-2	3.7.6-1	3.9.2-2
3.2.4-3	3.4.7-2	3.7.7-2	3.9.4-2
3.3.1-3	3.4.8-2	3.7.8-2	3.9.5-3
3.3.1-4	3.4.9-2	3.7.9-1	3.9.6-1
3.3.1-5	3.4.11-2	3.7.10-2	5.5-14
3.3.3-2	3.4.12-2	3.7.10-3	
3.3.4-2	3.4.13-2	3.7.11-1	
3.3.4-3	3.4.14-3	3.7.12-2	
3.3.5-2	3.4.14-4	3.7.13-2	
3.3.5-3	3.4.15-3	3.7.14-1	
3.3.6-1	3.4.16-2	3.7.15-1	
3.3.7-1	3.5.1-1	3.7.17-1	
3.3.8-2	3.5.1-2	3.7.18-2	
3.3.9-2	3.5.2-2	3.8.1-5	
3.3.10-1	3.5.2-3	3.8.1-6	
3.3.10-2	3.5.4-2	3.8.1-7	
3.3.11-2	3.6.2-4	3.8.1-8	
3.3.12-2	3.6.3-5	3.8.1-9	
3.3.13-2	3.6.3-7	3.8.1-10	

Note: As a result of the proposed changes, additional Technical Specification pages other than those listed above would need to be repaginated. As no content change would be required, the pages requiring repagination are not included in Attachment 1.

INSERT 1

In accordance with
the Surveillance
Frequency Control
Program

INSERT 2

5.5.18 Surveillance Frequency Control Program

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

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

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, “Risk-Informed Technical Specifications Initiative 5b, 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.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

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

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM is within the limits specified in the COLR.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	----------NOTES---------- 1. The predicted reactivity values shall be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. 2. This Surveillance is not required to be performed prior to entry into MODE 2. ----------	
	Verify measured core reactivity balance is within ± 1% Δk/k of predicted values.	Prior to entering MODE 1 after each fuel loading <u>AND</u> --------NOTE-------- Only required after 60 EFPD ---------- ~~31 EFPD thereafter~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more CONTROL RODS inoperable.	D.1.1 Verify SDM is within limit.	1 hour
	OR	
	D.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	
	D.2 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual CONTROL ROD positions are within 6.5% of their group average height.	~~12 hours~~ Insert 1
SR 3.1.4.2	Verify CONTROL ROD freedom of movement (trippability) by moving each individual CONTROL ROD that is not fully inserted ≥ 3% in any direction.	~~92 days~~ Insert 1
SR 3.1.4.3	----------NOTE---------- With rod drop times determined with less than four reactor coolant pumps operating, operation may proceed provided operation is restricted to the pump combination operating during the rod drop time determination. ----------	
	Verify the rod drop time for each CONTROL ROD, from the fully withdrawn position, is ≤ 1.58 seconds from power interruption at the CONTROL ROD drive cabinets to 3/4 insertion (25% withdrawn position) with T_{avg} ≥ 525°F.	Prior to reactor criticality after each removal of the reactor vessel head

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each safety rod is fully withdrawn.	~~12 hours~~ Insert 1

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 AXIAL POWER SHAPING ROD (APSR) Alignment Limits

LCO 3.1.6 Each APSR shall be OPERABLE, unless fully withdrawn, and shall be aligned within 6.5% of its group average height.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One APSR inoperable, not aligned within its limits, or both.	A.1 Perform SR 3.2.3.1.	2 hours AND 2 hours after each APSR movement
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify position of each APSR is within 6.5% of the group average height.	~~12 hours~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. OR The absolute position indicator channel and the relative position indicator channel inoperable for one or more rods.	C.1 Declare the rod(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify the absolute position indicator channels and the relative position indicator channels agree within the limit specified in the COLR.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify THERMAL POWER is ≤ 85% RTP.	~~1 hour~~ Insert 1
SR 3.1.8.2	----------NOTE---------- Only required to be met when THERMAL POWER is > 20% RTP. ---------- Perform SR 3.2.5.1.	Insert 1 ~~2 hours~~
SR 3.1.8.3	Verify High Flux trip setpoint is ≤ 10% RTP higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP.	~~8 hours~~ Insert 1
SR 3.1.8.4	Verify SDM is within the limits specified in the COLR.	~~24 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. SDM not within limit.	B.1 Initiate boration to restore SDM to within limit. AND B.2 Suspend PHYSICS TESTS exceptions.	15 minutes 1 hour
C. RCS lowest loop average temperature not within limit.	C.1 Suspend PHYSICS TESTS exceptions.	30 minutes
D. High Flux trip setpoint is not within limit. OR Nuclear instrumentation high startup rate control rod withdrawal inhibit inoperable.	D.1 Suspend PHYSICS TESTS exceptions.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Perform a CHANNEL FUNCTIONAL TEST on each nuclear instrumentation high startup rate control rod withdrawal inhibit and High Flux channel.	Once within 24 hours prior to initiating PHYSICS TESTS
SR 3.1.9.2	Verify the RCS lowest loop average temperature is ≥ 520°F.	~~30 minutes~~ Insert 1
SR 3.1.9.3	Verify THERMAL POWER is ≤ 5% RTP.	~~1 hour~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.1.9.4	Verify SDM is within the limits specified in the COLR.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify regulating rod groups are within the sequence and overlap limits as specified in the COLR.	~~12 hours~~ Insert 1
SR 3.2.1.2	Verify regulating rod groups meet the insertion limits as specified in the COLR.	~~12 hours~~ Insert 1
SR 3.2.1.3	Verify SDM is within the limit specified in the COLR.	Within 4 hours prior to achieving criticality

3.2 POWER DISTRIBUTION LIMITS

3.2.2 AXIAL POWER SHAPING ROD (APSR) Insertion Limits

LCO 3.2.2 APSRs shall be positioned within the limits specified in the COLR.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. APSRs not within limits.	A.1 ----------NOTE---------- Only required when THERMAL POWER is > 20% RTP. ---------- Perform SR 3.2.5.1.	Once per 2 hours
	AND	
	A.2 Restore APSRs to within limits.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify APSRs are within acceptable limits specified in the COLR.	~~12 hours~~

Insert 1

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL POWER IMBALANCE Operating Limits

LCO 3.2.3 AXIAL POWER IMBALANCE shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > 40% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AXIAL POWER IMBALANCE not within limits.	A.1 Perform SR 3.2.5.1. AND A.2 Reduce AXIAL POWER IMBALANCE within limits.	Once per 2 hours 24 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 40% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AXIAL POWER IMBALANCE is within limits as specified in the COLR.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	Verify QPT is within limits as specified in the COLR.	~~7 days~~ AND --------NOTE-------- Only required to be performed if both Condition C was entered and THERMAL POWER is ≥ 60% of ALLOWABLE THERMAL POWER ---------- When QPT has been restored to less than or equal to the steady state limit, once every hour for 12 hours, or until verified acceptable at ≥ 95% RTP

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. (continued)	AND	
	F.2.2 Initiate action to reduce THERMAL POWER to ≤ 98.4% RTP.	72 hours since the last calorimetric heat balance based on UFM readings
	AND	
	F.2.3 Reset High Flux – High Setpoint Allowable Value to ≤ 103.3% RTP.	82 hours since the last calorimetric heat balance based on UFM readings
G. UFM instrumentation not used to perform SR 3.3.1.2. AND THERMAL POWER > 50% RTP. AND Three RCPs operating.	G.1 Initiate action to reduce THERMAL POWER to ≤ 73.8% RTP.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.2	----------NOTES---------- 1. Adjust power range channel output if the calorimetric heat balance calculation results exceed power range channel output by > 2% RTP. 2. Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. ---------- Compare result of calorimetric heat balance calculation to power range channel output.	~~24 hours~~ Insert 1
SR 3.3.1.3	----------NOTES---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. For Function 8, flow rate measurement sensors may be excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	~~23 days on a STAGGERED TEST BASIS~~ Insert 1
SR 3.3.1.4	----------NOTES---------- 1. Adjust the power range channel imbalance output if the absolute value of the offset error is ≥ 2.5%. 2. Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. ---------- Compare results of out of core measured AXIAL POWER IMBALANCE (API_0) to incore measured AXIAL POWER IMBALANCE (API_1) as follows: $(RTP/TP)(API_0 - API_1)$ = offset error.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.5	Perform CHANNEL FUNCTIONAL TEST.	~~46 days on a STAGGERED TEST BASIS~~ Insert 1
SR 3.3.1.6	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1
SR 3.3.1.7	----------NOTE---------- For Function 8, flow rate measurement sensors are only required to be calibrated. ---------- Perform CHANNEL CALIBRATION.	~~24 months~~ Insert 1
SR 3.3.1.8	----------NOTE---------- Neutron detectors are excluded from RPS RESPONSE TIME testing. ---------- Verify that RPS RESPONSE TIME is within limits.	~~24 months on a STAGGERED TEST BASIS~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met in MODE 4 or 5. OR Two or more RTMs inoperable in MODE 4 or 5.	C.1 Open all CRD trip breakers. OR C.2 Remove power from all CRD trip breakers.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL FUNCTIONAL TEST.	~~23 days on a STAGGERED TEST BASIS~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2.1 Open all CRD trip breakers. OR C.2.2 Remove power from all CRD trip breakers.	6 hours 6 hours 6 hours
D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5.	D.1 Open all CRD trip breakers. OR D.2 Remove power from all CRD trip breakers.	6 hours 6 hours
E. ----------NOTE---------- Required Action E.1 shall be completed whenever this Condition is entered. ---------- One or both SCR relay trip channels inoperable.	E.1 Restore the channel(s) to OPERABLE status.	Prior to entering MODE 4, when in MODE 5 for ≥ 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL FUNCTIONAL TEST on CRD trip breakers.	~~23 days on a STAGGERED TEST BASIS~~

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.4.2	Perform CHANNEL FUNCTIONAL TEST on SCR relay trip channels.	~~24 months~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 ----------NOTE---------- Only required for RCS Pressure - Low Low channels. ----------	
	Reduce RCS pressure < 660 psig.	36 hours
	AND	
	B.4 ----------NOTE---------- Only required for Containment Pressure - High, Containment Pressure - High High, and Borated Water Storage Tank - Low Low channels. ----------	
	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.5-1 to determine which SRs apply to each SFAS instrumentation Parameter.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform CHANNEL CHECK.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.5.2	----------NOTE---------- When an SFAS channel is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed for up to 8 hours, provided two other channels of the same SFAS instrumentation Parameter are OPERABLE. ---------- Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1
SR 3.3.5.3	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1
SR 3.3.5.4	Perform CHANNEL CALIBRATION.	~~24 months~~ Insert 1
SR 3.3.5.5	Verify SFAS RESPONSE TIME within limits.	~~24 months on a STAGGERED TEST BASIS~~ Insert 1

3.3 INSTRUMENTATION

3.3.6 Safety Features Actuation System (SFAS) Manual Initiation

LCO 3.3.6 Two manual initiation channels of each one of the SFAS Functions below shall be OPERABLE:

a. SFAS; and

b. Containment Spray.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when associated engineered safety features equipment is required to be OPERABLE.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SFAS Functions with one channel inoperable.	A.1 Restore channel to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL FUNCTIONAL TEST.	~~24 months~~ Insert 1

3.3 INSTRUMENTATION

3.3.7 Safety Features Actuation System (SFAS) Automatic Actuation Logic

LCO 3.3.7 All the SFAS automatic actuation output logics shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when associated engineered safety features equipment is required to be OPERABLE.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each automatic actuation output logic.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more automatic actuation output logics inoperable.	A.1 Place associated output logic in trip.	1 hour
	OR	
	A.2 Place associated component(s) in engineered safety features configuration.	1 hour
	OR	
	A.3 Declare the associated component(s) inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform automatic actuation output logic CHANNEL FUNCTIONAL TEST.	~~31 days on a STAGGERED TEST BASIS~~ Insert 1

SURVEILLANCE REQUIREMENTS

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

When EDG LOPS instrumentation is placed in an inoperable status solely for performance of a Surveillance, entry into associated Conditions and Required Actions may be delayed up to 2 hours, provided the other channel monitoring the Function for the bus is OPERABLE and the two channels monitoring the Function for the other bus are OPERABLE.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	----------NOTE---------- The as-left instrument setting shall be returned to a setting within the tolerance band of the trip setpoint established to protect the safety limit. ---------- Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1
SR 3.3.8.2	----------NOTE---------- The as-left instrument setting shall be returned to a setting within the tolerance band of the trip setpoint established to protect the safety limit. ---------- Perform CHANNEL CALIBRATION with Allowable Value as follows: a. Degraded Voltage ≥ 3712 volts (dropout) and ≤ 3771 volts (pickup) with a time delay of ≥ 6.4 seconds and ≤ 7.9 seconds; and b. Loss of Voltage ≥ 2071 volts (dropout) and ≤ 2492 volts (pickup) with a time delay of ≥ 0.42 seconds and ≤ 0.58 seconds.	~~12 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 Open CONTROL ROD drive trip breakers. AND B.4 Verify SDM is within the limits specified in the COLR.	1 hour 1 hour AND Once per 12 hours thereafter
C. One or more source range neutron flux channels inoperable with neutron flux > 1E-10 amp on the intermediate range neutron flux channels.	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.9.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	 ~~18 months~~ Insert 1

3.3 INSTRUMENTATION

3.3.10 Intermediate Range Neutron Flux

LCO 3.3.10 Two intermediate range neutron flux channels shall be OPERABLE.

APPLICABILITY: MODE 2,
MODES 3, 4, and 5 with any CONTROL ROD drive (CRD) trip breaker in the closed position and the CRD System capable of rod withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Reduce neutron flux to ≤ 1E-10 amp.	2 hours
B. Required Action and associated Completion Time of Condition A not met. OR Two channels inoperable.	B.1 ----------NOTE---------- Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. ---------- Suspend operations involving positive reactivity changes. AND B.2 Open CRD trip breakers.	 Immediately 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.10.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.10.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.11-1 to determine which SRs shall be performed for each SFRCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.11.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.11.2	----------NOTE---------- When a channel is placed in an inoperable status solely for performance of the CHANNEL FUNCTIONAL TEST, entry into the associated Conditions and Required Actions may be delayed for up to 8 hours provided the channels providing input to the other actuation channel are OPERABLE. --- Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1
SR 3.3.11.3	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1
SR 3.3.11.4	Perform CHANNEL CALIBRATION.	~~24 months~~ Insert 1
SR 3.3.11.5	~~----------NOTE----------~~ ~~"N" equals 2 channels for the purpose of determining the STAGGERED TEST BASIS Frequency.~~ ~~---~~ Verify SFRCS RESPONSE TIME is within limits.	~~24 months on a STAGGERED TEST BASIS~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.12.1	Perform CHANNEL FUNCTIONAL TEST.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.13.1	----------NOTE---------- When a channel is placed in an inoperable status solely for performance of the CHANNEL FUNCTIONAL TEST, entry into the associated Conditions and Required Actions may be delayed for up to 8 hours provided the other actuation channel is OPERABLE. ---------- Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~

Insert 1

3.3 INSTRUMENTATION

3.3.14 Fuel Handling Exhaust - High Radiation

LCO 3.3.14 Two channels of Fuel Handling Exhaust - High Radiation shall be OPERABLE.

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

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Declare the associated Spent Fuel Pool Area Emergency Ventilation System train inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.14.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.14.2	Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1
SR 3.3.14.3	Perform CHANNEL CALIBRATION with a trip setpoint of ≤ 2 times Background.	~~18 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. Required Action and associated Completion Time of Condition A or B not met during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.15.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.15.2	----------NOTE---------- When a channel is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed for up to 3 hours provided the other channel is OPERABLE. ---------- Perform CHANNEL FUNCTIONAL TEST.	 ~~92 days~~ Insert 1
SR 3.3.15.3	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 ----------NOTE---------- Only applicable for Function 1. ---------- Reduce THERMAL POWER to ≤ 45% RTP.	6 hours
	AND	
	B.2 ----------NOTE---------- Only applicable for Functions 2 and 3. ---------- Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.16-1 to determine which SRs apply to each ARTS instrumentation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.16.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.16.2	Perform CHANNEL FUNCTIONAL TEST.	~~23 days on a STAGGERED TEST BASIS~~ Insert 1
SR 3.3.16.3	Perform CHANNEL CALIBRATION.	~~46 days on a STAGGERED TEST BASIS~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.17-1 for the channel.	Immediately
E. As required by Required Action B.2 or D.1 and referenced in Table 3.3.17-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.17-1	F.1 Initiate action in accordance with Specification 5.6.5.	Immediately

SURVEILLANCE REQUIREMENTS

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

These SRs apply to each PAM instrumentation Function in Table 3.3.17-1 except where identified in the SR.

SURVEILLANCE		FREQUENCY
SR 3.3.17.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.17.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for Functions 1, 11, 12, 14, 15, 16, and 17.	~~18 months~~ Insert 1
SR 3.3.17.3	Perform CHANNEL CALIBRATION for Functions 2, 3, 4, 5, 6, 7, 8, 9, 10, and 13.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.18.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~ Insert 1
SR 3.3.18.2	----------NOTE---------- Reactor trip breaker indication and control rod position switches are excluded from this Surveillance. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~24 months~~ Insert 1
SR 3.3.18.3	Verify each control circuit and transfer switch required for a serious control room or cable spreading room fire is capable of performing the intended function.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	----------NOTE---------- With three RCPs operating, the limits are applied to the loop with two RCPs in operation. ---------- Verify RCS loop pressure ≥ 2064.8 psig with four RCPs operating or ≥ 2060.8 psig with three RCPs operating.	~~12 hours~~ Insert 1
SR 3.4.1.2	----------NOTE---------- With three RCPs operating, the limits are applied to the loop with two RCPs in operation. ---------- Verify RCS hot leg temperature ≤ 610°F.	~~12 hours~~ Insert 1
SR 3.4.1.3	Verify RCS total flow ≥ 389,500 gpm with four RCPs operating or ≥ 290,957 gpm with three RCPs operating.	~~12 hours~~ Insert 1
SR 3.4.1.4	----------NOTE---------- Not required to be performed until 24 hours after stable thermal conditions are established at ≥ 70% RTP. ---------- Verify RCS total flow rate is within limit by measurement.	~~18 months~~ Insert 1

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each RCS loop average temperature (T_{avg}) shall be ≥ 525°F.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.2.1 Verify RCS T_{avg} in each loop ≥ 525°F.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ---------- Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits specified in the PTLR.	~~30 minutes~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify required RCS loops are in operation.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify one RCS loop is in operation.	~~12 hours~~ Insert 1
SR 3.4.5.2	Verify, for each required RCS loop, SG secondary side water level is: a. ≥ 18 inches above the lower tube sheet if associated reactor coolant pump is operating; or b. ≥ 35 inches above the lower tube sheet if reactor coolant pumps are not operating.	~~12 hours~~ Insert 1
SR 3.4.5.3	----------NOTE---------- Not required to be performed until 24 hours after a required pump is not in operation. ---------- Verify correct breaker alignment and indicated power available to each required pump.	~~7 days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two required loops inoperable. OR Required loop not in operation.	B.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1. AND B.2 Initiate action to restore one loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify required DHR or RCS loop is in operation.	~~12 hours~~ Insert 1
SR 3.4.6.2	Verify, for each required RCS loop, SG secondary side water level is: a. ≥ 18 inches above the lower tube sheet if associated reactor coolant pump is operating; or b. ≥ 35 inches above the lower tube sheet if reactor coolant pumps are not operating.	~~12 hours~~ Insert 1
SR 3.4.6.3	----------NOTE---------- Not required to be performed until 24 hours after a required pump is not in operation. ---------- Verify correct breaker alignment and indicated power available to each required pump.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify required DHR or RCS loop is in operation.	~~12 hours~~ Insert 1
SR 3.4.7.2	Verify, for each required RCS loop, SG secondary side water level is ≥ 35 inches above the lower tube sheet.	~~12 hours~~ Insert 1
SR 3.4.7.3	----------NOTE---------- Not required to be performed until 24 hours after a required pump is not in operation. ---------- Verify correct breaker alignment and indicated power available to each required DHR pump.	~~7 days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. No required DHR loop OPERABLE. OR Required DHR loop not in operation.	B.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1. AND B.2 Initiate action to restore one DHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify required DHR loop is in operation.	~~12 hours~~ Insert 1
SR 3.4.8.2	----------NOTE---------- Not required to be performed until 24 hours after a required pump is not in operation. ---------- Verify correct breaker alignment and indicated power available to each required DHR pump.	 ~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level ≤ 228 inches.	~~12 hours~~ Insert 1
SR 3.4.9.2	Verify capacity of essential pressurizer heaters is ≥ 85 kW.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	----------NOTE---------- Not required to be performed with block valve closed in accordance with the Required Actions of this LCO. ---------- Perform one complete cycle of the block valve.	~~92 days~~ Insert 1
SR 3.4.11.2	Perform one complete cycle of the PORV.	~~24 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and Associated Completion Time not met.	D.1	Disable capability of both high pressure injection pumps to inject water into the RCS.	1 hour
	AND		
	D.2	Disable makeup pump suction automatic transfer to the borated water storage tank on low makeup tank level.	8 hours
	AND		
	D.3	Verify makeup tank level ≤ 73 inches.	8 hours
	AND		
	D.4	Verify RCS pressure and pressurizer level in Acceptable Region of Figure 3.4.12-1 or 3.4.12-2, as applicable.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify RCS to DHR isolation valves open with control power removed.	~~24 hours~~ Insert 1
SR 3.4.12.2	Verify DHR System relief valve lift setpoint ≤ 330 psig in accordance with the INSERVICE TESTING PROGRAM.	In accordance with the INSERVICE TESTING PROGRAM

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	Perform CHANNEL CHECK on the DHR System interlock channel common to Safety Features Actuation System (SFAS) instrumentation.	~~12 hours~~ Insert 1
SR 3.4.14.2	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify: a. Leakage from each RCS PIV is equivalent to ≤ 5.0 gpm at an RCS pressure of 2155 psig; and b. When current measured rate is > 1 gpm, the current measured rate has not exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and 5.0 gpm by 50%.	Insert 1 ~~24 months~~ <u>AND</u> Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months
SR 3.4.14.3	----------NOTE---------- Not required to be met when the DHR System interlock function is disabled in accordance with LCO 3.4.12. ---------- Verify DHR System interlock function prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 328 psig.	~~24 months~~ Insert 1
SR 3.4.14.4	----------NOTE---------- Not required to be met when the DHR System interlock function is disabled in accordance with LCO 3.4.12. ---------- Verify DHR System interlock function causes the valves to close automatically with a simulated or actual RCS pressure signal ≥ 328 psig.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.5	Perform CHANNEL CALIBRATION on the DHR System interlock channels.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of required containment atmosphere radioactivity monitor.	~~12 hours~~ Insert 1
SR 3.4.15.2	Perform CHANNEL FUNCTIONAL TEST of required containment atmosphere radioactivity monitor.	~~31 days~~ Insert 1
SR 3.4.15.3	Perform CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	~~18 months~~ Insert 1
SR 3.4.15.4	Perform CHANNEL CALIBRATION of containment sump monitor.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify reactor coolant gross specific activity ≤ 100/Ē μCi/gm.	~~7 days~~ Insert 1
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	~~14 days~~ Insert 1 AND Between 2 and 6 hours after THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.16.3	----------NOTE---------- Not required to be performed until 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. ---------- Determine Ē.	Insert 1 ~~184 days~~

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Core Flooding Tanks (CFTs)

LCO 3.5.1 Two CFTs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with Reactor Coolant System (RCS) pressure > 800 psig.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CFT inoperable due to boron concentration not within limits.	A.1 Restore boron concentration to within limits.	72 hours
B. One CFT inoperable for reasons other than Condition A.	B.1 Restore CFT to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Reduce RCS pressure to ≤ 800 psig.	6 hours 18 hours
D. Two CFTs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each CFT isolation valve is fully open.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.2	Verify borated water volume in each CFT is ≥ 12.6 feet and ≤ 13.3 feet.	~~12 hours~~ Insert 1
SR 3.5.1.3	Verify nitrogen cover pressure in each CFT is ≥ 580 psig and ≤ 620 psig.	~~12 hours~~ Insert 1
SR 3.5.1.4	Verify boron concentration in each CFT is ≥ 2600 ppm and ≤ 3500 ppm.	~~31 days~~ Insert 1 AND --------NOTE-------- Only required to be performed for affected CFT Once within 6 hours after each solution volume increase of ≥ 80 gallons that is not the result of addition from the borated water storage tank
SR 3.5.1.5	Verify power is removed from each CFT isolation valve operator.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.5.2.2	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.5.2.3	Verify ECCS piping is full of water by venting the ECCS pump casings and discharge piping high points.	~~24 months~~ Insert 1 AND Prior to declaring ECCS OPERABLE after draining ECCS piping
SR 3.5.2.4	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.5.2.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.5.2.6	Verify the correct position of each mechanical stop for the following valves: a. DH-14A; and b. DH-14B.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.7	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	~~24 months~~ Insert 1
SR 3.5.2.8	Verify the following: a. Each BWST outlet valve and containment emergency sump valve actuate to the correct position on a manual actuation of the containment emergency sump valve; and b. The actuation time of each BWST outlet valve and containment emergency sump valve is ≤ 75 seconds.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	----------NOTE---------- Only required to be performed when ambient air temperature is < 35°F or > 90°F. ---------- Verify BWST borated water temperature is ≥ 35°F and ≤ 90°F.	~~24 hours~~ Insert 1
SR 3.5.4.2	Verify BWST borated water volume is ≥ 500,100 gallons and ≤ 550,000 gallons.	~~7 days~~ Insert 1
SR 3.5.4.3	Verify BWST boron concentration is ≥ 2600 ppm and ≤ 2800 ppm.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Secondary containment bypass leakage not within limit.	E.1 Restore secondary containment bypass leakage to within limit.	4 hours
F. Required Action and associated Completion Time not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	Verify each 48 inch containment purge and exhaust valve is closed with control power removed.	~~31 days~~ Insert 1
SR 3.6.3.2	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ---------- Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.5	Perform leakage rate testing for containment purge and exhaust valves with resilient seals.	Within 72 hours after each valve closure, if valve opened in MODE 1, 2, 3, or 4 AND Prior to entering MODE 4 from MODE 5 if valve opened in other than MODE 1, 2, 3, or 4 AND Prior to entering MODE 2 from MODE 3 each time the plant has been in any combination of MODE 3, 4, 5, or 6 for > 72 hours, if not performed in the previous 184 days
SR 3.6.3.6	Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.6.3.7	Verify the combined leakage for all secondary containment bypass leakage paths is ≤ 0.03 L_a.	In accordance with the Containment Leakage Rate Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -14 inches water gauge and ≤ +25 inches water gauge.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1	Verify containment pressure is within limits.	~~12 hours~~

Insert 1

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

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

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	~~24 hours~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two required containment air cooling trains inoperable.	E.1 Restore one required containment air cooling train to OPERABLE status.	72 hours
F. Required Action and associated Completion Time of Condition C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours
G. Two containment spray trains inoperable. OR Any combination of three or more required trains inoperable.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	~~31 days~~ Insert 1
SR 3.6.6.2	Operate each required containment air cooling train for ≥ 15 minutes.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.3	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.6.4	Verify each required containment air cooling train starts automatically on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.6.6.5	Verify each required containment air cooling train cooling water flow rate is ≥ 1150 gpm.	~~24 months~~ Insert 1
SR 3.6.6.6	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.6.6.7	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	Following maintenance that could result in nozzle blockage.

3.6 CONTAINMENT SYSTEMS

3.6.7 Trisodium Phosphate Dodecahydrate (TSP) Storage

LCO 3.6.7 The TSP storage baskets shall contain ≥ 290 ft^3 of TSP.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TSP storage baskets contain < 290 ft^3 of TSP.	A.1 Restore TSP storage baskets to ≥ 290 ft^3 of TSP.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify contained volume of TSP in the TSP storage baskets is within limit.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify isolation time of each MSIV is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.2.2	Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two valves in the same flow path inoperable.	D.1 Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the isolation time of each MFSV is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.3.2	Verify the isolation time of each MFCV and SFCV is within limits.	~~24 months~~ Insert 1
SR 3.7.3.3	Verify each MFSV, MFCV, and SFCV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.4 Turbine Stop Valves (TSVs)

LCO 3.7.4 Four TSVs shall be OPERABLE.

APPLICABILITY: MODES 1,
MODES 2 and 3 except when all TSVs are closed.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more TSVs inoperable.	A.1 Close inoperable TSV. AND A.2 Verify inoperable TSV is closed	8 hours Once per 7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify isolation time of each TSV is within limits.	~~24 months~~ Insert 1
SR 3.7.4.2	Verify each TSV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required MDFP train inoperable in MODE 4.	F.1 Initiate action to restore MDFP train to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	----------NOTE---------- In MODE 1 ≤ 40% RTP and MODES 2, 3, and 4, the MDFP train valves are allowed to be in the non-correct position, provided the valves are capable of being locally realigned to the correct position. ---------- Verify each EFW manual, power operated, and automatic valve in each water flow path and in both steam supply flow paths to the AFW pumps, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.7.5.2	----------NOTE---------- Not required to be performed until 24 hours after reaching 800 psig in the steam generators. ---------- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	~~92 days~~ Insert 1
SR 3.7.5.3	----------NOTE---------- Not required to be performed until 73 hours after MDFP train is aligned to the AFW System. ---------- Operate the MDFP train.	~~92 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.4	----------NOTE---------- Not required to be performed until 24 hours after reaching 800 psig in the steam generators. ---------- Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.5.5	----------NOTE---------- Not required to be performed until 24 hours after reaching 800 psig in the steam generators. ---------- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.5.6	Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tanks to each steam generator.	Prior to entering MODE 2 following refueling or whenever plant has been in MODE 5, MODE 6, or defueled for a cumulative period of > 30 days
SR 3.7.5.7	Verify proper alignment of the required MDFP flow paths by verifying flow from the condensate storage tanks to each steam generator.	Prior to entering MODE 3 following refueling or whenever plant has been in MODE 5, MODE 6, or defueled for a cumulative period of > 30 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.8	Perform CHANNEL CHECK on each AFW train Steam Generator Level Control System.	~~12 hours~~ Insert 1
SR 3.7.5.9	Perform CHANNEL FUNCTIONAL TEST on each AFW train Steam Generator Level Control System.	~~31 days~~ Insert 1
SR 3.7.5.10	Perform CHANNEL CALIBRATION on each AFW train Steam Generator Level Control System.	~~24 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tanks (CSTs)

LCO 3.7.6 The CSTs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The CSTs inoperable.	A.1 Verify by administrative means OPERABILITY of backup water supply.	4 hours AND Once per 12 hours thereafter
	AND A.2 Restore CSTs to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND B.2 Be in MODE 4 without reliance on steam generator for heat removal.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify usable volume in the CSTs is ≥ 270,300 gal.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	----------NOTE---------- Isolation of CCW flow to individual components does not render CCW System inoperable. ---------- Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.7.3	Verify each required CCW pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	----------NOTE---------- Isolation of SWS flow to individual components does not render the SWS inoperable. ---------- Verify each SWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.7.8.2	Verify each SWS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.8.3	Verify each required SWS pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of UHS is ≥ 562 ft International Great Lakes Datum.	~~24 hours~~ Insert 1
SR 3.7.9.2	Verify average water temperature of UHS is ≤ 90°F.	~~24 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. CRE boundary inoperable during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREVS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREVS train for ≥ 15 minutes.	~~31 days~~ Insert 1
SR 3.7.10.2	Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Verify Control Room Normal Ventilation System isolates on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.10.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.10.5	Verify the system makeup flow rate is ≥ 270 cfm and ≤ 330 cfm when supplying the control room with outside air.	~~24 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.11 Two CREATCS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREATCS train inoperable.	A.1 Restore CREATCS train to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CREATCS train has the capability to remove the assumed heat load.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each Station EVS train for ≥ 15 minutes.	~~31 days~~ Insert 1
SR 3.7.12.2	Perform required Station EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.3	Verify each Station EVS train actuates on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.12.4	Verify one Station EVS train can attain a negative pressure ≥ 0.25 inches water gauge in the annulus ≤ 4 seconds after the flow rate is ≥ 7200 cfm and ≤ 8800 cfm.	~~24 months on a STAGGERED TEST BASIS~~ Insert 1
SR 3.7.12.5	Verify each Station EVS filter cooling bypass damper can be opened.	~~24 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two Spent Fuel Pool Area EVS trains inoperable.	C.1 Suspend movement of irradiated fuel assemblies in the spent fuel pool building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each Spent Fuel Pool Area EVS train for ≥ 15 minutes.	~~31 days~~ Insert 1
SR 3.7.13.2	Perform required Spent Fuel Pool Area EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	Verify each Spent Fuel Pool Area EVS train actuates on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.13.4	Verify one Spent Fuel Pool Area EVS train can maintain a negative pressure ≥ 0.125 inches water gauge relative to outside atmosphere.	~~24 months on a STAGGERED TEST BASIS~~ Insert 1
SR 3.7.13.5	Verify each Spent Fuel Pool Area EVS filter cooling bypass damper can be opened.	~~24 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.14 Spent Fuel Pool Water Level

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

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14.1	Verify the spent fuel pool water level is ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.	~~7 days~~ Insert 1

3.7 PLANT SYSTEMS

3.7.15 Spent Fuel Pool Boron Concentration

LCO 3.7.15 The spent fuel pool boron concentration shall be ≥ 630 ppm.

APPLICABILITY: When fuel assemblies are stored in the spent fuel pool and a spent fuel pool verification has not been performed since the last movement of fuel assemblies in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent fuel pool boron concentration not within limit.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	A.1 Suspend movement of fuel assemblies in the spent fuel pool.	Immediately
	AND	
	A.2.1 Initiate action to restore spent fuel pool boron concentration to within limit.	Immediately
	OR	
	A.2.2 Initiate action to perform a fuel storage pool verification.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the spent fuel pool boron concentration is within limit.	~~7 days~~ Insert 1

3.7 PLANT SYSTEMS

3.7.17 Secondary Specific Activity

LCO 3.7.17 The specific activity of the secondary coolant shall be ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.17.1	Verify the specific activity of the secondary coolant is ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1	Verify steam generator water level to be within limits.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	~~7 days~~ Insert 1
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/or gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.8 must be met. ---------- Verify each EDG starts from standby conditions and achieves steady state voltage ≥ 4088 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.	~~31 days~~ Insert 1
SR 3.8.1.3	----------NOTES---------- 1. EDG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one EDG at a time. 4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.8. ---------- Verify each EDG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2340 kW and ≤ 2600 kW.	~~31 days~~ Insert 1
SR 3.8.1.4	Verify each day tank contains ≥ 4000 gal of fuel oil.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	~~31 days~~ Insert 1
SR 3.8.1.6	Verify interval between each sequenced load block is within ± 10% of design interval for each emergency load sequencer and each emergency time delay relay.	~~31 days~~ Insert 1
SR 3.8.1.7	Verify the fuel oil transfer system operates to transfer fuel oil from fuel oil storage tank to the day tank.	~~92 days~~ Insert 1
SR 3.8.1.8	----------NOTE---------- All EDG starts may be preceded by an engine prelube period. ---------- Verify each EDG starts from standby condition and achieves: a. In ≤ 10 seconds, voltage ≥ 4070 V and frequency ≥ 59.5 Hz; and b. Steady state voltage ≥ 4088 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.	~~184 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTES---------- 1. SR 3.8.1.9.a is only required to be met when the unit auxiliary source is supplying the electrical power distribution subsystem. 2. The automatic transfer portion of SR 3.8.1.9.a and all of SR 3.8.1.9.b shall not normally be performed in MODE 1 or 2. However, they may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify automatic and manual transfer of AC power sources from: a. The unit auxiliary source to the pre-selected offsite circuit; and b. The normal offsite circuit to the alternate offsite circuit.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.10	----------NOTES---------- 1. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the EDG synchronized with offsite power, it shall be performed within the power factor limit. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ---------- 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.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTES---------- 1. All EDG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify on an actual or simulated loss of offsite power signal: a. De-energization of essential buses; b. Load shedding from essential buses; and c. EDG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ 10 seconds; 2. Energizes auto-connected shutdown loads through individual time delay relays; 3. Maintains steady-state voltage ≥ 4088 V and ≤ 4400 V; 4. Maintains steady-state frequency ≥ 59.5 Hz and ≤ 60.5 Hz; and 5. Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each EDG's noncritical automatic trips are bypassed on actual or simulated loss of voltage signal on the essential bus or an actual or simulated Safety Features Actuation System (SFAS) actuation signal.	~~24 months~~ Insert 1
SR 3.8.1.13	----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 3. If performed with EDG synchronized with offsite power, it shall be performed within the power factor limit. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ---------- Verify each EDG operates for ≥ 8 hours: a. For ≥ 2 hours loaded ≥ 2730 kW and ≤ 2860 kW; and b. For the remaining hours of the test loaded ≥ 2340 kW and ≤ 2600 kW.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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 ≥ 1 hour loaded ≥ 2340 kW and ≤ 2600 kW. Momentary transients outside of load range do not invalidate this test. 2. All EDG starts may be preceded by an engine prelube period. ---------- Verify each EDG starts and achieves: a. In ≤ 10 seconds, voltage ≥ 4070 V and frequency ≥ 59.5 Hz; and b. Steady state voltage ≥ 4088 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTES---------- 1. All EDG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated SFAS actuation signal: a. De-energization of essential buses; b. Load shedding from essential buses; c. EDG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ 10 seconds; 2. Energizes auto-connected emergency loads through load sequencer and individual time delay relays; 3. Achieves steady-state voltage ≥ 4088 V and ≤ 4400 V; 4. Achieves steady-state frequency ≥ 59.5 Hz and ≤ 60.5 Hz; and 5. Supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~24 months~~ 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. OR One or more EDGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E.	F.1 Declare associated EDG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 32,000 gal of fuel.	~~31 days~~ Insert 1
SR 3.8.3.2	Verify lube oil inventory for each EDG is ≥ 260 gal.	~~31 days~~ Insert 1
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each required EDG air start receiver pressure is ≥ 210 psig.	~~31 days~~ Insert 1
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	~~7 days~~ Insert 1
SR 3.8.4.2	Verify each required battery charger supplies ≥ 475 amps at greater than or equal to the minimum established float voltage for ≥ 8 hours. OR Verify each required battery charger can recharge the battery to the fully charged state within 12 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	~~18 months~~ Insert 1
SR 3.8.4.3	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required actual or simulated emergency loads for the design duty cycle when subjected to a battery service test.	~~24 months~~ 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. OR One or more batteries with one or more battery cells float voltage ≤ 2.07 V and float current > 2 amps. OR SR 3.8.6.6 not met.	F.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 2 amps.	~~7 days~~ Insert 1
SR 3.8.6.2	Verify each battery pilot cell voltage is > 2.07 V.	~~31 days~~ Insert 1
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~31 days~~ Insert 1
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.5	Verify each battery connected cell voltage is > 2.07 V.	~~92 days~~ Insert 1
SR 3.8.6.6	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	Insert 1 ~~60 months~~ <u>AND</u> 12 months when battery shows degradation, or has reached 85% of the expected life with capacity < 100% of manufacturer's rating <u>AND</u> 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify, for each inverter, correct inverter voltage, frequency, and alignment to the associated 120 VAC vital bus.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify, for the required inverter, correct inverter voltage, frequency, and alignment to the associated 120 VAC vital bus.	~~7 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.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	~~7 days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Declare associated required decay heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	~~7 days~~ Insert 1

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

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

APPLICABILITY: MODE 6.

----------NOTE----------
Only applicable to the refueling canal when connected to the RCS.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	~~72 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.9.2.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Close equipment hatch and secure with four bolts.	4 hours
	AND	
	A.5 Close one door in each air lock.	4 hours
	AND	
	A.6 Verify each penetration providing direct access from the containment atmosphere to the outside atmosphere is either closed with a manual or automatic isolation valve, blind flange, or equivalent, or is capable of being closed by a Containment Purge and Exhaust Isolation System.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify one DHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 2800 gpm.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify one DHR loop is in operation.	~~12 hours~~ Insert 1
SR 3.9.5.2	----------NOTE---------- Not required to be performed until 24 hours after a required pump is not in operation. ---------- Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	~~7 days~~ Insert 1

3.9 REFUELING OPERATIONS

3.9.6 Refueling Canal Water Level

LCO 3.9.6 Refueling canal water level shall be maintained ≥ 23 ft above the top of the reactor vessel flange.

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify refueling canal water level is ≥ 23 ft above the top of reactor vessel flange.	~~24 hours~~ Insert 1

5.5 Programs and Manuals

5.5.17 Control Room Envelope Habitability Program (continued)

occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem whole body or its equivalent to any part of the body for the duration of the accident. The program shall include the following elements:

a. The definition of the CRE and the CRE boundary;

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

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

d. Measurements, 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 train of the CREVS, operating at the flow rate required by the VFTP, at a Frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 24 month assessment of the CRE boundary;

e. The quantitative limits on unfiltered air leakage 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 Specification 5.5.17.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; and

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 Specifications 5.5.17.c and 5.5.17.d, respectively.

Insert 2

Davis-Besse Nuclear Power Station

Proposed Technical Specification Bases Changes (Mark-Ups) – For Information Only

The following lists the pages included within Attachment 2:

B3.1.1-4*	B3.3.6-3	B3.4.3-7	B3.6.3-11
B3.1.1-5	B3.3.7-4	B3.4.4-4	B3.6.3-13
B3.1.2-5	B3.3.8-6	B3.4.5-3	B3.6.4-3
B3.1.4-8	B3.3.9-3	B3.4.5-4	B3.6.5-2
B3.1.5-4	B3.3.9-4	B3.4.6-4	B3.6.6-7
B3.1.6-3	B3.3.9-5	B3.4.6-5	B3.6.6-8
B3.1.7-6	B3.3.10-3	B3.4.7-4	B3.6.6-9
B3.1.8-5	B3.3.10-4	B3.4.7-5	B3.6.7-3
B3.1.8-6	B3.3.11-11	B3.4.8-3	B3.7.2-3
B3.1.8-7	B3.3.11-12	B3.4.9-5	B3.7.2-4
B3.1.9-5	B3.3.11-13*	B3.4.11-4	B3.7.3-4
B3.1.9-6	B3.3.11-14	B3.4.12-5	B3.7.4-2*
B3.2.1-8	B3.3.11-15	B3.4.13-4*	B3.7.4-3
B3.2.2-4	B3.3.12-3	B3.4.13-5	B3.7.5-6*
B3.2.3-6	B3.3.13-5	B3.4.13-6	B3.7.5-7
B3.2.4-8	B3.3.14-2	B3.4.14-4*	B3.7.5-8
B3.3.1-21	B3.3.14-3	B3.4.14-5	B3.7.5-9
B3.3.1-22	B3.3.15-4	B3.4.14-6	B3.7.5-10
B3.3.1-23	B3.3.15-5	B3.4.15-5	B3.7.6-3
B3.3.1-24	B3.3.16-4	B3.4.15-6	B3.7.7-3
B3.3.1-25	B3.3.16-5	B3.4.16-3	B3.7.7-4
B3.3.1-26	B3.3.16-6	B3.4.16-4	B3.7.8-3
B3.3.1-27	B3.3.17-10	B3.5.1-6	B3.7.8-4
B3.3.1-28*	B3.3.17-11	B3.5.1-7	B3.7.9-3
B3.3.1-29	B3.3.17-12	B3.5.2-6	B3.7.10-5
B3.3.3-4	B3.3.18-4	B3.5.2-7	B3.7.10-6
B3.3.4-5	B3.3.18-5	B3.5.2-8	B3.7.11-2*
B3.3.5-13	B3.4.1-4	B3.5.4-5	B3.7.11-3
B3.3.5-14	B3.4.1-5	B3.6.2-6	B3.7.12-4
B3.3.5-15	B3.4.2-2	B3.6.3-10	B3.7.12-5

* No change. Included for context.

Davis-Besse Nuclear Power Station

Proposed Technical Specification Bases Changes (Mark-Ups) – For Information Only

The following lists the pages included within Attachment 2:

B3.7.13-4
B3.7.13-5
B3.7.14-2
B3.7.15-3
B3.7.17-3
B3.7.18-4
B3.8.1-13
B3.8.1-14
B3.8.1-15
B3.8.1-16
B3.8.1-17
B3.8.1-18
B3.8.1-19*
B3.8.1-20
B3.8.1-21
B3.8.1-22
B3.8.1-23*
B3.8.1-24
B3.8.1-25*
B3.8.3-4*
B3.8.3-5
B3.8.3-6*
B3.8.3-7
B3.8.4-6
B3.8.4-7
B3.8.4-8
B3.8.6-5
B3.8.6-6
B3.8.6-7
B3.8.7-3*
B3.8.7-4
B3.8.8-4
B3.8.9-7
B3.8.10-4
B3.9.1-3
B3.9.2-3
B3.9.4-4
B3.9.5-4
B3.9.5-5*
B3.9.6-2

* No change. Included for context.

INSERT 3

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

INSERT 4

The Surveillance Frequencies are controlled under the Surveillance Frequency Control Program.

BASES

APPLICABILITY (continued)

shutdown reactivity requirements are given in LCO 3.9.1, “Boron Concentration.”

ACTIONS

A.1

If the SDM requirements are not met, boration must be initiated promptly. A Completion Time of 15 minutes is adequate for an operator to correctly align and start the required systems and components. It is assumed that boration will be continued until the SDM requirements are met. If the SDM limit is not met due to high steam generator level, RCS boration must be continued until the SDM for an RCS average temperature of < 280°F is achieved.

In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. Since it is imperative to raise the boron concentration of the RCS as soon as possible, the boron concentration should be a highly concentrated solution, such as that normally found in the boric acid addition tanks or the borated water storage tank. The operator should borate with the best source available for the plant conditions.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

The SDM is verified by performing a reactivity balance calculation, considering, but not limited to, the listed reactivity effects:

a. RCS boron concentration;

b. CONTROL ROD position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.1.1 (continued)

~~The Frequency of 24 hours is based on the generally slow change in required boron concentration, and also allows sufficient time for the operator to collect the required data, which includes performing a boron concentration analysis, and complete the calculation.~~

Insert 3

REFERENCES

1. UFSAR, Appendix 3D.1.22, Criterion 26 – Reactivity Control System Redundancy and Capability.
2. UFSAR, Section 15.
3. 10 CFR 100, "Reactor Site Criteria."
4. NRC Safety Evaluation for Technical Specification Amendment 192, NRC Letter, Log No. 4424, dated October 7, 1994.

BASES

ACTIONS

A.1 and A.2 (continued

The required Completion Time of 7 days is adequate for preparing operating restrictions or surveillances that may be required to allow continued reactor operation.

B.1

If any Required Action and associated Completion Time cannot be met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then boration required by Required Action A.1 of LCO 3.1.1 would occur. The allowed Completion Time of 6 hours 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 3.1.2.1

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made considering that other core conditions are fixed or stable, including CONTROL ROD and APSR positions, RCS average temperature, THERMAL POWER, fuel burnup based on gross thermal energy generation, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 as an initial check on core conditions and design calculations at BOC. A Note is included in the SR to indicate that the normalization of predicted core reactivity to the measured value must take place within the first 60 effective full power days (EFPD) after each fuel loading. This allows sufficient time for core conditions to reach steady state, but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. ~~The required subsequent Frequency of 31 EFPD, following the initial 60 EFPD after entering MODE 1 is acceptable, based on the slow rate of core reactivity changes due to fuel depletion and the presence of other indicators (QPT, etc.) for prompt indication of an anomaly.~~ Another Note is included in the SRs to indicate that the performance of the Surveillance is not required for entry into MODE 2.

Insert 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual rods are aligned within 6.5% of their group average height limits ~~at a 12 hour Frequency~~ allows the operator to detect a rod that is beginning to deviate from its expected position. ~~The specified Frequency takes into account other rod position information that is continuously available to the operator in the control room, so that during actual rod motion, deviations can immediately be detected.~~

Insert 3

SR 3.1.4.2

Verifying each CONTROL ROD is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each CONTROL ROD could result in radial tilts. Exercising each individual CONTROL ROD that is not fully inserted ~~every 92 days~~ provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each CONTROL ROD by 3% will not cause radial or axial power tilts, or oscillations, to occur. ~~The 92 day Frequency takes into consideration other information available to the operator in the control room and SR 3.1.4.1, which is performed more frequently and adds to the determination of OPERABILITY of the rods.~~ ~~B~~etween required performances of SR 3.1.4.2 (determination of CONTROL ROD OPERABILITY by movement), if a CONTROL ROD(S) is discovered to be immovable, but is determined to be trippable, the CONTROL ROD(S) is considered to be OPERABLE. At any time, if a CONTROL ROD(S) is immovable, a determination of the trippability (OPERABILITY) of the CONTROL ROD(S) must be made, and appropriate action taken.

Insert 3

SR 3.1.4.3

Verification of rod drop time allows the operator to determine that the maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analysis. The rod drop time given in the safety analysis is 1.4 seconds to 2/3 insertion. Using the identical rod drop curve gives a value of 1.58 seconds to 3/4 insertion. The latter value is used in the Surveillance because the zone reference lights are located at 3/4 insertion, which provides the most accurate position indication. The zone reference lights will activate at 3/4 insertion to give an indication of the rod drop time and rod location. Measuring rod drop times, prior to reactor criticality after reactor vessel head removal, ensures that the reactor internals and CRDM will not interfere with CONTROL ROD motion or rod drop time. This Surveillance is performed during a plant outage, due to the plant conditions needed to perform the SR and the potential for an unplanned plant transient if the Surveillance were performed with the reactor at power.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that each safety rod is fully withdrawn ensures the rods are available to provide reactor shutdown capability.

Verification that individual safety rod positions are fully withdrawn ~~at a 12 hour Frequency~~ allows the operator to detect a rod beginning to deviate from its expected position. ~~Also, the 12 hour Frequency takes into account other information available in the control room for the purpose of monitoring the status of the safety rods.~~ Insert 3

REFERENCES

1. UFSAR, Appendices 3D.1.6, Criterion 10 – Reactor Design; 3D.1.21, Criterion 25 – Protection System Requirements For Reactivity Control Malfunctions; 3D.1.22, Criterion 26 – Reactivity Control System Redundancy and Capability; 3D.1.23, Criterion 27 – Combined Reactivity Control Systems Capability; and 3D.1.24, Criterion 28 – Reactivity Limits.

2. 10 CFR 50.46.

3. UFSAR, Section 15.4.3.

BASES

ACTIONS

A.1 (continued)

accordance with the limits in the COLR. This restores the alignment requirements. Deviations up to 2 hours will not cause significant xenon redistribution to occur. This alternative assumes the APSR group movement does not cause the limits of LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits," to be exceeded. For this reason, APSR group movement is only practical for instances where small movements of the APSR group are sufficient to re-establish APSR alignment.

The reactor may continue in operation with the APSR misaligned if the limits on AXIAL POWER IMBALANCE are surveilled within 2 hours to determine if the AXIAL POWER IMBALANCE is still within limits. Also, since any additional movement of the APSRs may result in additional imbalance, Required Action A.1 also requires the AXIAL POWER IMBALANCE Surveillance to be performed again within 2 hours after each APSR movement. The required Completion Time of up to 2 hours will not cause significant xenon redistribution to occur.

B.1

The plant must be brought to a MODE in which the LCO does not apply if the Required Actions and associated Completion Times cannot be met. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, for reaching MODE 3 from RTP in an orderly manner and without challenging plant systems. In MODE 3, APSR group alignment limits are not required because the reactor is not generating THERMAL POWER and excessive local LHRs cannot occur from APSR misalignment.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

Verification ~~at a 12 hour Frequency~~ that individual APSR positions are within 6.5% of the group average height limits allows the operator to detect an APSR beginning to deviate from its expected position. In addition, APSR position is continuously available to the operator in the control room so that during actual rod motion, deviations can immediately be detected. Insert 3

BASES

ACTIONS (continued)

C.1

If any Required Action and associated Completion Time is not met or if both the absolute position indicator channel and relative position indicator channel are inoperable for one or more rods, the position of the rod(s) is not known with certainty. Therefore, each affected rod must be declared inoperable, and the limits of LCO 3.1.4 or LCO 3.1.6 apply. The required Completion Time for declaring the rod(s) inoperable is immediately. Therefore LCO 3.1.4 or LCO 3.1.6 is entered immediately, and the required Completion Times for the appropriate Required Actions in those LCOs apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

Verification is required that the Absolute Position Indicator channels and Relative Position Indicator channels agree within the limit given in the COLR. This verification ensures that the Relative Position Indicator channels, which are regarded as the potentially less reliable means of position indication, remain OPERABLE and accurate. ~~The required Frequency of 12 hours is adequate for verifying that no degradation in system OPERABILITY has occurred.~~

Insert 3

REFERENCES

1. UFSAR, Appendix 3D.1.9, Criterion 13 – Instrumentation and Control.

2. UFSAR, Section 15.

BASES

ACTIONS (continued)

B.1

If THERMAL POWER exceeds 85% RTP, then 1 hour is allowed for the operator to reduce THERMAL POWER to within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCO, addressed by PHYSICS TESTS exceptions.

If the High Flux trip setpoint is not within the specified limits, then 1 hour is allowed for the operator to restore the High Flux trip setpoint within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCO, addressed by these PHYSICS TESTS exceptions.

If the results of the incore flux map indicate that either F_Q or $F^N_{\Delta H}$ has exceeded its limit when THERMAL POWER is greater than 20% RTP, then PHYSICS TESTS are suspended. This action is required because of direct indication that the core peaking factors, which are fundamental initial conditions for the safety analysis, are excessive. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification.

This Condition is modified by a Note that requires performance of the Required Action only when THERMAL POWER is greater than 20% RTP. This establishes an ACTIONS entry Condition that is consistent with LCO provision c and the Applicability of LCO 3.2.5, "Power Peaking Factors."

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

Verification that THERMAL POWER is ≤ 85% RTP ensures that the required additional thermal margin has been established prior to and during PHYSICS TESTS. ~~The required Frequency of once per hour allows the operator adequate time to determine any degradation of the established thermal margin during PHYSICS TESTS.~~

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.2

Verification that F_Q and $F^N_{\Delta H}$ are within their limits ensures that core local linear heat rate and departure from nucleate boiling ratio will remain within their limits, while one or more of the LCOs that normally control these design limits are out of specification. ~~The required Frequency of 2 hours allows the operator adequate time for collecting a flux map and for performing the hot channel factor verifications, based on operating experience.~~ If SR 3.2.5.1 is not met, PHYSICS TESTS are suspended and LCO 3.2.5 applies. ~~This Frequency is more conservative than the Completion Time for restoration of the individual LCOs that preserve the F_Q and $F^N_{\Delta H}$ limits.~~

Insert 3

This SR is modified by a Note that requires performance only when THERMAL POWER is greater than 20% RTP. This establishes a performance requirement that is consistent with the Applicability of LCO 3.2.5, "Power Peaking Factors."

SR 3.1.8.3

Verification that the High Flux trip setpoint is within the limit specified for each PHYSICS TEST ensures that core protection at the reduced power level is established and will remain in place during the PHYSICS TESTS. ~~Performing the verification once every 8 hours allows the operator adequate time for determining any degradation of the established trip setpoint margin before and during PHYSICS TESTS and for adjusting the High Flux trip setpoint.~~

Insert 3

SR 3.1.8.4

The SDM is verified by performing a reactivity balance calculation, considering, but not limited to, the following reactivity effects:

a. Reactor Coolant System (RCS) boron concentration;

b. Control rod position;

c. Doppler defect;

d. Fuel burnup based on gross thermal energy generation;

e. Samarium concentration;

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.4 (continued)

f. Xenon concentration; and

g. Moderator defect.

~~The Frequency of 24 hours is based on the generally slow change in required boron concentration and on the low probability of an accident occurring without the required SDM.~~

Insert 3

REFERENCES

1. 10 CFR 50, Appendix B, Section XI.
2. 10 CFR 50.59.
3. Regulatory Guide 1.68, Revision 2, August 1978.
4. UFSAR, Appendix 4B.
5. UFSAR, Section 14.1.
6. UFSAR, Tables 14.1-2 and 14.1-3.
7. UFSAR, Appendix 4B, Section 9.

BASES

ACTIONS

D.1 (continued)

If the nuclear instrumentation high startup rate control rod withdrawal inhibit function is inoperable, then 1 hour is allowed for the operator to restore the function to OPERABLE status or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCOs addressed by PHYSICS TESTS exceptions.

The nuclear instrumentation high startup rate control rod withdrawal inhibit function is not required when the reactor power level is above the operating range of the instrumentation channel. For example, if the reactor power level is above the source range channel operating range, then only the intermediate range high startup rate control rod withdrawal inhibit is required to be functional.

SURVEILLANCE REQUIREMENTS

SR 3.1.9.1

Performing a CHANNEL FUNCTIONAL TEST on each nuclear instrumentation source and intermediate range high startup rate control rod withdrawal inhibit and High Flux channel, ensures that the instrumentation required to detect a deviation from THERMAL POWER or to detect a high startup rate is OPERABLE. Performing the test once within 24 hours, prior to initiating PHYSICS TESTS, ensures that the instrumentation is OPERABLE shortly before PHYSICS TESTS begin and allows the operator to correct any instrumentation problems.

SR 3.1.9.2

Verification that the RCS lowest loop average temperature is ≥ 520ºF will ensure that the unit is operating in a condition consistent with the LCO requirements. ~~Verification of the RCS temperature at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the conditions of the LCO are met.~~ Insert 3

SR 3.1.9.3

Verification that THERMAL POWER is ≤ 5% RTP ensures that an adequate margin is maintained between the THERMAL POWER level and the High Flux trip setpoint. ~~Hourly verification is adequate for the~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.9.3 (continued)

~~operator to determine any change in core conditions, such as xenon redistribution occurring after a THERMAL POWER reduction, that could cause THERMAL POWER to exceed the specified limit.~~

Insert 3

SR 3.1.9.4

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

a. RCS boron concentration;

b. CONTROL ROD position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Samarium concentration;

f. Xenon concentration;

g. Isothermal temperature coefficient (ITC), when below the point of adding heat (POAH);

h. Moderator defect, when above the POAH; and

i. Doppler defect, when above the POAH.

Using the ITC accounts for Doppler reactivity in this calculation when the reactor is subcritical or critical but below the POAH, and the fuel temperature will be changing at the same rate as the RCS.

~~The Frequency of 24 hours is based on the generally slow change in required boron concentration and on the low probability of an accident occurring without the required SDM.~~

Insert 3

BASES

ACTIONS

D.2.2 (continued)

simultaneously with the limit out of specification in this relatively short time period. In addition, it precludes long term depletion with abnormal group insertions or configurations and limits the potential for an adverse xenon redistribution.

E.1

If any Required Action and associated Completion Time of Condition C or D is not met, then the reactor is placed in MODE 3, in which this LCO does not apply. This Action ensures that the reactor does not continue operating in violation of the peaking limits, the ejected rod worth, the reactivity insertion rate assumed as initial conditions in the accident analyses, or the required minimum SDM assumed in the accident analyses. The required Completion Time of 6 hours is reasonable, based on operating experience regarding the amount of time required to reach MODE 3 from RTP without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

This Surveillance ensures that the sequence and overlap limits are not violated. ~~A Surveillance Frequency of 12 hours is acceptable because little rod motion occurs in 12 hours due to fuel burnup. Also, the Frequency takes into account other information available in the control room for monitoring the status of the regulating rods.~~ Insert 3

SR 3.2.1.2

Verification of the regulating rod insertion limits as specified in the COLR ~~at a Frequency of 12 hours~~ is sufficient to detect regulating rod groups that may be approaching the group insertion limits~~, because little rod motion due to fuel burnup occurs in 12 hours. Also, the Frequency takes into account other information available in the control room for monitoring the status of the regulating rods.~~ Insert 3

BASES

ACTIONS (continued)

A.2

Indefinite operation with the APSRs inserted or withdrawn in violation of the times specified in the COLR is not prudent. Even if power peaking monitoring per Required Action A.1 is continued, the abnormal APSR insertion or withdrawal may cause an adverse xenon redistribution, may cause the limits on AXIAL POWER IMBALANCE to be exceeded, or may affect the long term fuel depletion pattern. Therefore, power peaking monitoring is allowed for up to 24 hours. This required Completion Time is reasonable based on the low probability of an event occurring simultaneously with the APSR limit out of specification. In addition, it precludes long term depletion with the APSRs in positions that have not been analyzed, thereby limiting the potential for an adverse xenon redistribution. This time limit also ensures that the intended burnup distribution is maintained, and allows the operator sufficient time to reposition the APSRs to correct their positions.

Because the APSRs are not operated by the automatic control system, manual action by the operator is required to restore the APSRs to the positions specified in the COLR.

B.1

If any Required Action and associated Completion Time is not met, the reactor must be placed in MODE 3, in which this LCO does not apply. This action ensures that the fuel does not continue to be depleted in an unintended burnup distribution. The required Completion Time of 6 hours is reasonable, based on operating experience regarding the time required to reach MODE 3 from RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

Fuel cycle designs that allow APSR withdrawal near EOC do not permit reinsertion of APSRs after the time of withdrawal. ~~Verification that the APSRs are within their insertion limits at a 12 hour Frequency is sufficient to ensure that the APSR insertion limits are preserved. The 12 hour Frequency required for performing this verification is sufficient because APSRs are positioned by manual control and are normally moved infrequently. The Frequency takes into account other information available in the control room for monitoring the axial power distribution in the reactor core.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.3.1

Verification of the AXIAL POWER IMBALANCE indication ~~every 12 hours~~ ensures that the AXIAL POWER IMBALANCE limits are not violated and takes into account other information available to the operator in the control room. This Surveillance Frequency is acceptable because the mechanisms that can cause AXIAL POWER IMBALANCE, such as xenon redistribution or CONTROL ROD drive mechanism malfunctions that cause slow AXIAL POWER IMBALANCE increases, can be discovered by the operator before the specified limits are violated.

Insert 3

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Section 6.3
3. UFSAR, Section 15.4.3.
4. UFSAR, Appendix 3D.1.23, Criterion 27 – Combined Reactivity Control Systems Capability.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.4.1

~~Checking the QPT indication every 7 days ensures that the operator can determine whether the plant computer software and Incore Detector System inputs for monitoring QPT are functioning properly and takes into account other information available to the operator in the control room. This procedure allows the QPT mechanisms, such as xenon redistribution, burnup gradients, and CONTROL ROD drive mechanism malfunctions, which can cause slow development of a QPT, to be detected. Operating experience has confirmed the acceptability of a Surveillance Frequency of 7 days.~~ Insert 3

Following restoration of the QPT to within the steady state limit, operation at ≥ 95% RTP may proceed provided the QPT is determined to remain within the steady state limit at the increased THERMAL POWER level. In case QPT exceeds the steady state limit for more than 24 hours or exceeds the transient limit (Condition A or B), the potential for xenon redistribution is greater. Therefore, the QPT is monitored once every hour for 12 hours to determine whether the period of any oscillation due to xenon redistribution causes the QPT to exceed the steady state limit again.

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Section 6.3.
3. UFSAR, Section 15.4.3.
4. UFSAR, Appendix 3D.1.23, Criterion 27 – Combined Reactivity Control Systems Capability.
5. BAW 10122A, Rev. 1, May 1984.

BASES

ACTIONS (continued)

F.1, F.2, and G.1 (continued)

values are normalized to the last UFM values used in the calorimetric heat balance calculation. The difference between UFM feedwater temperature measurements and feedwater resistance temperature detector measurements is within the margin allowance of the UFM temperature uncertainty and will have no effect on the heat balance uncertainty.

In addition, when operating with four reactor coolant pumps, the Reactor Protection System High Flux – High Setpoint Allowable Value must be reset to the value specified in Table 3.3.1-1 Note (e) within ten hours (Required Action F.1.2) or within 82 hours since the last calorimetric heat balance based on UFM readings (Required Action F.2.3). This reduction ensures that when the increased uncertainty of the instrumentation is considered, the maximum analytical setpoint value of 110.2% RTP will not be exceeded as required by the safety analyses. Historical comparison of the two feedwater flow measurement systems used for secondary-side heat balance calculations above 50% RTP, UFM-based and feedwater venturi-based, indicates that the two methods do not diverge significantly during power operations over short periods of time. The long-term fouling of the venturis results in a more conservative feedwater flow input to the heat balance calculation. Nuclear Instrumentation (NI) trend analysis indicates that the NI to heat balance comparison will not drift significantly over a three-week period, and surveillance data indicates essentially no drift of the RPS High Flux - High Setpoint trip setpoints. Accordingly, the accuracy and conservatism of the RPS High Flux –High Setpoint trip is acceptable during the completion times of Required Actions F.1.2 or F.2.3.

SURVEILLANCE REQUIREMENTS

The SRs for each RPS Function are identified by the SRs column of Table 3.3.1-1 for that Function. Most Functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, CHANNEL CALIBRATION, and RPS RESPONSE TIME testing.

The SRs are modified by a Note. The Note directs the reader to Table 3.3.1-1 to determine the correct SRs to perform for each RPS Function.

SR 3.3.1.1

~~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

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1 (continued)

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

Agreement criteria are determined by the unit staff based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~The Frequency, 12 hours, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal but more frequent checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

Insert 3

For Functions that trip on a combination of several measurements, such as the Flux - ΔFlux - Flow, the CHANNEL CHECK must be performed on each input.

SR 3.3.1.2

This SR is the performance of a heat balance calibration for the power range channels ~~every 24 hours~~ when reactor power is ≥ 15% RTP. The heat balance calibration consists of a comparison of the results of the calorimetric with the power range channel output. The outputs of the power range channels are normalized to the calorimetric. Note 1 to the SR clarifies that if the calorimetric heat balance calculation results exceed the Nuclear Instrumentation System (NIS) channel output by > 2% RTP, the NIS is not declared inoperable but must be adjusted. If the NIS

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2 (continued)

channel cannot be properly adjusted, the channel is declared inoperable. Note 2 clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are inaccurate.

The power range channel's output shall be adjusted consistent with the calorimetric results if the calorimetric heat balance calculation results exceed the power range channel's output by > 2% RTP. The value of 2% is adequate because this value is assumed in the safety analyses of UFSAR, Chapter 15 (Ref. 8). These checks and, if necessary, the adjustment of the power range channels ensure that channel accuracy is maintained within the analyzed error margins. ~~The 24 hour Frequency is adequate, based on unit operating experience, which demonstrates the change in the difference between the power range indication and the calorimetric results rarely exceeds a small fraction of 2% RTP in any 24 hour period. Furthermore, the control room operators monitor redundant indications and alarms to detect deviations in channel outputs.~~

Insert 3

SR 3.3.1.3

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The 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 drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the unit specific setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint analysis. The Surveillance includes two Notes. The first Note to the Surveillance indicates that neutron detectors are excluded from CHANNEL CALIBRATION. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. The second Note states that for Function 8, Flux - ΔFlux - Flow, flow rate measurement sensors may be excluded from CHANNEL CALIBRATION for this SR. This is acceptable because these sensors are calibrated in accordance with SR 3.3.1.7 ~~every 24 months~~.

~~The Frequency is justified by the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

~~setpoint analysis. However, the test is performed every 23 days on a STAGGERED TEST BASIS.~~ Insert 3

SR 3.3.1.3 for Function 1.a is modified by two Notes as identified in Table 3.3.1-1. Function 1.a is an LSSS for protection system instrument channels that protect reactor core or RCS pressure boundary Safety Limits. Some components (e.g., mechanical devices which have an on or off output or an open/close position such as limit switches, float switches, and proximity detectors) are not calibrated in the traditional sense and do not have as-left or as-found conditions that would indicate drift of the component setpoint. These devices are considered not trendable and the requirements of the Notes are not required to be applied to the mechanical portion of the functions. Where a non-trendable component provides signal input to other channel components that can be trended, the remaining components must be evaluated in accordance with the Notes. 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. For digital channel components, the as-found tolerance may be identical to the as-left tolerance since drift may not be an expected error. In these cases a channel as-found value outside the as-left condition may be cause for component assessment. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition for continued OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance around the Limiting Trip Setpoint (LTSP), or a value that is more conservative than the LTSP. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance or a setting more conservative than the LTSP, then the instrument channel shall be declared inoperable. The second Note also requires that the LTSP and the methodology used to determine the LTSP, the predefined as-found acceptance band, and the as-left setpoint tolerance band are specified in the Technical Requirements Manual (TRM) (Ref. 2).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.4

A comparison of power range nuclear instrumentation channels against incore detectors shall be performed ~~at a 31 day Frequency~~ when reactor power is ≥ 50% RTP and THERMAL POWER is steady. The SR is modified by two Notes. Note 2 clarifies that 24 hours is allowed for performing the first Surveillance after reaching 50% RTP. Note 1 clarifies that if the absolute difference between the power range and incore measurements is ≥ 2.5%, the power range channel is not inoperable, but an adjustment of the measured imbalance to agree with the incore measurements is necessary. If the power range channel cannot be properly recalibrated, the channel is declared inoperable. The calculation of the Allowable Value envelope assumes a difference in out of core to incore measurements of 2.5%. Additional inaccuracies beyond those that are measured are also included in the setpoint envelope calculation. ~~The 31 day Frequency is adequate, considering that long term drift of the excore linear amplifiers is small and burnup of the detectors is slow. Also, the excore readings are a strong function of the power produced in the peripheral fuel bundles, and do not represent an integrated reading across the core. The slow changes in neutron flux during the fuel cycle can also be detected at this interval.~~

Insert 3

SR 3.3.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required RPS 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 if 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. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1. Any setpoint adjustment shall be consistent with the assumptions of the current unit specific setpoint analysis.

The as-found and as-left values were recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis (Ref. 9).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.5 (continued)

~~The Frequency of 46 days on a STAGGERED TEST BASIS is consistent with the calculations of Reference 10 that indicate the RPS retains a high level of reliability for this test interval.~~ Insert 3

SR 3.3.1.5 for Function 5 is modified by two Notes as identified in Table 3.3.1-1. Function 5 is an LSSS for protection system instrument channels that protect reactor core or RCS pressure boundary Safety Limits. Some components (e.g., mechanical devices which have an on or off output or an open/close position such as limit switches, float switches, and proximity detectors) are not calibrated in the traditional sense and do not have as-left or as-found conditions that would indicate drift of the component setpoint. These devices are considered not trendable and the requirements of the Notes are not required to be applied to the mechanical portion of the functions. Where a non-trendable component provides signal input to other channel components that can be trended, the remaining components must be evaluated in accordance with the Notes. 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. For digital channel components, the as-found tolerance may be identical to the as-left tolerance since drift may not be an expected error. In these cases a channel as-found value outside the as-left condition may be cause for component assessment. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition for continued OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance around the Limiting Trip Setpoint, or a value that is more conservative than the Limiting Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance or a setting more conservative than the LTSP, then the instrument channel shall be declared inoperable. The second Note also requires that the LTSP and the methodology used to determine the LTSP, the predefined as-found acceptance criteria band, and the as-left setpoint tolerance band are specified in the TRM (Ref. 2).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.6

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The 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 drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the unit specific setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint analysis.

~~The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ Insert 3

SR 3.3.1.7

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The 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 drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the unit specific LTSP analysis. CHANNEL CALIBRATONS must be performed consistent with the assumptions of the unit specific setpoint analysis. Whenever a resistance temperature detector (RTD) sensing element is replaced, the next required CHANNEL CALIBRATION of the RTD sensors is accomplished by an inplace qualitative calibration that compares the other sensing elements with the recently installed sensing element. A Note to the SR states that for Function 8, Flux - ΔFlux - Flow, only the flow rate measurement sensors are required to be calibrated.

~~The Frequency is justified by the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.7 (continued)

SR 3.3.1.7 for Function 5 is modified by two Notes as identified in Table 3.3.1-1. Function 5 is an LSSS for protection system instrument channels that protect reactor core or RCS pressure boundary Safety Limits. Some components (e.g., mechanical devices which have an on or off output or an open/close position such as limit switches, float switches, and proximity detectors) are not calibrated in the traditional sense and do not have as-left or as-found conditions that would indicate drift of the component setpoint. These devices are considered not trendable and the requirements of the Notes are not required to be applied to the mechanical portion of the functions. Where a non-trendable component provides signal input to other channel components that can be trended, the remaining components must be evaluated in accordance with the Notes. 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. For digital channel components, the as-found tolerance may be identical to the as-left tolerance since drift may not be an expected error. In these cases a channel as-found value outside the as-left condition may be cause for component assessment. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition for continued OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance around the LTSP, or a value that is more conservative than the LTSP. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance or a setting more conservative than the LTSP, then the instrument channel shall be declared inoperable. The second Note also requires that the LTSP and the methodology used to determine the LTSP, the predefined as-found acceptance criteria band, and the as-left setpoint tolerance band are specified in the TRM (Ref. 2).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.8

This SR verifies individual channel actuation response times are less than or equal to the maximum values assumed in the accident analysis. Individual component response times are not modeled in the analyses. The analyses model the overall, or total, elapsed time from the point at which the parameter exceeds the analytical limit at the sensor to the point of rod insertion (CRD trip breakers open). Thus, this SR encompasses the reactor trip module components covered by LCO 3.3.3 and the operation of the mechanical components covered by LCO 3.3.4 (i.e., the CRD trip breakers). Response time testing acceptance criteria are included in Reference 2.

A Note to the Surveillance indicates that neutron detectors are excluded from RPS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. The response time of the neutron flux signal portion of the channel shall be measured from the neutron detector output or from the input of the first electronic components in the channel.

~~Response time tests are conducted on a 24 month STAGGERED TEST BASIS. Testing of the final actuation device (the CRD breakers) is included in the testing of each channel. Therefore, staggered testing results in response time verification of these devices every 96 months. The 24 month Frequency is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1

The SRs include performance of a CHANNEL FUNCTIONAL TEST ~~every 23 days on a STAGGERED TEST BASIS.~~ This test shall verify the OPERABILITY of the RTM and its ability to receive and properly respond to channel trip and reactor trip signals. 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 if 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. ~~Calculations have shown that the Frequency (23 days) maintains a high level of reliability of the Reactor Trip System in BAW-10167A, Supplement 3 (Ref. 2).~~

Insert 3

REFERENCES

1. UFSAR, Section 7.2, Figure 7.2-1.

~~2. BAW-10167A, Supplement 3, February 1998.~~

BASES

ACTIONS

D.1 and D.2

If any Required Action and associated Completion Time of Condition A or B is not met in MODE 4 or 5, the unit must be brought to a condition in which the LCO does not apply. To achieve this status, all CRD trip breakers must be opened or power from all CRD trip breakers removed within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open all CRD trip breakers or remove power from all CRD trip breakers without challenging unit systems.

E.1

Condition E represents a loss of redundancy for the CRD trip Function. Condition E applies when one or both SCR relay channels are inoperable. The action is to restore the channel(s) to OPERABLE status prior to entering MODE 4, when in MODE 5 for ≥ 24 hours.

The Completion Time is acceptable because the CRD breakers are still available to trip the reactor on an RPS, ARTS, or Manual Trip signal.

Condition E is modified by a Note requiring Required Action E.1 to be completed whenever the Condition is entered. The Note is necessary to ensure the inoperable SCR(s) are restored to OPERABLE status when MODE 5 is entered for ≥ 24 hours.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

SR 3.3.4.1 is to perform a CHANNEL FUNCTIONAL TEST of the CRD trip breakers ~~every 23 days on a STAGGERED TEST BASIS.~~ This test verifies the OPERABILITY of the trip devices by actuation of the end devices. Also, this test independently verifies the undervoltage and shunt trip mechanisms of the AC breakers. ~~Calculations have shown that the Frequency (23 days) maintains a high level of reliability of the Reactor Trip System in BAW-10167A, Supplement 3 (Ref. 2).~~

Insert 3

SR 3.3.4.2

SR 3.3.4.2 is to perform a CHANNEL FUNCTIONAL TEST of the SCR relay trip channels ~~every 24 months.~~ This test verifies the OPERABILITY of the trip devices by actuation of the end devices. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency.~~

Insert 3

REFERENCES

1. UFSAR, Section 7.4, Figure 7.4-1.

2. BAW-10167A, Supplement 3, February 1998.

BASES

SURVEILLANCE REQUIREMENTS

The SRs for each SFAS instrumentation Parameter are identified by the SRs column of Table 3.3.5-1 for that Parameter.

SR 3.3.5.1

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

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

~~The Frequency, 12 hours, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel operability during normal operational use of the displays associated with the channels required by the LCO.

Insert 3

SR 3.3.5.2

The Surveillance is modified by a Note that states when an SFAS channel is placed in an inoperable status solely for performance of this Surveillance, entry into the associated Conditions and Required Actions may be delayed for up to 8 hours, provided two other channels of the same SFAS instrumentation Parameter are OPERABLE. Upon completion of the Surveillance, or expiration of the 8 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This is acceptable since the other two required channels will continue to ensure the associated SFAS Parameter can perform its assumed function. This allowance is based on the inability to perform the Surveillance in the time permitted by the Required Actions. Eight hours is the average time required to perform

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2 (continued)

the Surveillance. It is not acceptable to routinely remove channels from service for more than 8 hours to perform required Surveillance testing.

A CHANNEL FUNCTIONAL TEST is performed on each required SFAS channel to ensure the entire channel will perform the intended functions. 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 if 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 unit specific setpoint analysis. The CHANNEL FUNCTIONAL TEST of the RCS Pressure – Low and – Low Low instrumentation includes the logic for the RCS pressure operating bypasses.

~~The Frequency of 31 days is based on unit 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.~~ Insert 3

SR 3.3.5.3 and SR 3.3.5.4

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the unit specific setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint analysis. The CHANNEL CALIBRATION of the RCS Pressure – Low and – Low Low instrumentation includes the RCS pressure operating bypass function.

~~This Frequency of SR 3.3.5.3 is justified by the assumption of an 18 month calibration interval to determine the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.5.4 is justified by the assumption of a 24 month calibration interval to determine the magnitude of equipment drift in the setpoint analysis.~~ Insert 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.5

SR 3.3.5.5 ensures that the SFAS actuation channel response times are less than or equal to the maximum times assumed in the accident analysis. The response time values are the maximum values assumed in the safety analyses. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time from the point at which the parameter exceeds the actuation setpoint value at the sensor to the point at which the end device is actuated. Thus, this SR encompasses the automatic actuation logic components covered by LCO 3.3.7 and the operation of the mechanical ESF components. Response time testing acceptance criteria for this unit are included in Reference 8.

~~Response time tests are conducted on an 24 month STAGGERED TEST BASIS. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. Therefore, staggered testing results in response time verification of these devices every 24 months. The 24 month test Frequency is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation but not channel failure are infrequent occurrences.~~

Insert 3

REFERENCES

1. UFSAR, Table 7.3-2.
2. UFSAR, Figures 7.3-1 through 7.3-8.
3. UFSAR, Section 7.3.1.1.2.
4. 10 CFR 50.49.
5. ISA RP 67.04-Part II - 1994, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation."
6. ISA RP 67.04.02 - 2000, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation."
7. UFSAR, Section 6.3.
8. Technical Requirements Manual.

BASES

ACTIONS

A.1 (continued)

of SFAS Function initiation via individual component controls. The 72 hour Completion Time is consistent with the allowed outage time for the safety systems actuated by SFAS (i.e., Required Action B.1 in LCO 3.5.2, "Emergency Core Cooling System - Operating").

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the SFAS manual initiation. This test verifies that the initiating circuitry is OPERABLE and will actuate the end device (i.e., pump, valves, etc.). ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency is demonstrated to be sufficient, based on operating experience, which shows these components usually pass the Surveillance when performed on the 24 month Frequency.~~

Insert 3

REFERENCES None.

BASES

ACTIONS

A Note has been added to the ACTIONS indicating separate Condition entry is allowed for each SFAS automatic actuation output logic.

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

When one or more automatic actuation output logics are inoperable, either the output logic may be tripped or the associated component(s) can be placed in its engineered safety features configuration. Required Action A.1 places the associated output logic in its actuated condition while Required Action A.2 is equivalent to the automatic actuation output logic performing its safety function ahead of time. In some cases, placing the component in its engineered safety features configuration would violate unit safety or operational considerations. In these cases, the component status should not be changed, but the supported system component must be declared inoperable. Conditions which would preclude the placing of a component in its engineered safety features configuration include, but are not limited to, violation of system separation, activation of fluid systems that could lead to thermal shock, or isolation of fluid systems that are normally functioning. The Completion Time of 1 hour is based on operating experience and reflects the urgency associated with the inoperability of a safety system component.

Required Action A.3 requires entry into the Required Actions of the affected supported systems, since the true effect of automatic actuation logic failure is inoperability of the supported system. The Completion Time of 1 hour is based on operating experience and reflects the urgency associated with the inoperability of a safety system component.

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1

SR 3.3.7.1 is the performance of a CHANNEL FUNCTIONAL TEST ~~on a 31 day STAGGERED TEST BASIS. The test demonstrates that every automatic actuation logic associated with one of the two safety actuation trains successfully performs the two-out-of-four logic combinations every 31 days. All automatic actuation logics are thus retested every 62 days.~~ The test simulates the required one-out-of-four inputs to the logic circuit and verifies the successful operation of the automatic actuation logic. ~~The Frequency is based on operating experience that demonstrates the rarity of more than one channel failing within the same 31 day interval.~~

Insert 3

Automatic actuation logic response time testing is incorporated into the response time testing required by LCO 3.3.5.

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Section 6.3.

BASES

SURVEILLANCE REQUIREMENTS

The Note to the Surveillance Requirements allows channel bypass for testing without entering the applicable Conditions and Required Actions even though the channel is inoperable during this time period and cannot actuate a diesel start. This allowance is based in the assumption that 2 hours is the average time required to perform channel Surveillance. The 2 hour testing allowance does not significantly reduce the probability that the EDG will start when necessary. It is not acceptable to routinely remove channels from service for more than 2 hours to perform required Surveillance testing.

SR 3.3.8.1

A CHANNEL FUNCTIONAL TEST is performed on each required EDG LOPS channel to ensure the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable if 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 adjustments shall be consistent with the assumptions of the current unit specific setpoint calculations. As Noted, the as-left instrument setting shall be returned to a setting within the tolerance band of the trip setpoint established to protect the safety limit. ~~The Frequency of 31 days is considered reasonable based on the reliability of the components and on operating experience that demonstrates channel failure is rare.~~

Insert 3

SR 3.3.8.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The setpoints and the response to a loss of voltage and a degraded voltage test shall include a single point verification that the trip occurs within the required delay time. CHANNEL CALIBRATION shall find that measurement setpoint errors are within the assumptions of the unit specific setpoint calculations. As Noted, the as-left instrument setting shall be returned to a setting within the tolerance band of the trip setpoint established to protect the safety limit.

~~The Frequency is based on operating experience and is justified by the assumption of a 12 month calibration interval in the determination of equipment drift in the setpoint calculation.~~

Insert 3

BASES

ACTIONS

B.1, B.2, B.3, and B.4 (continued)

CONTROL RODS, and opening the CONTROL ROD drive trip breakers and verifying SDM is within limit within 1 hour. Periodic SDM verification is then required to provide a means for detecting the slow reactivity changes that could be caused by mechanisms other than control rod withdrawal or operations involving positive reactivity changes. Since the source range instrumentation provides the only reliable direct indication of power in this condition, the operators must continue to verify the SDM every 12 hours until at least one channel of the source range instrumentation is returned to OPERABLE status. Required Action B.1, Required Action B.2, and Required Action B.3 preclude rapid positive reactivity additions. The 1 hour Completion Time for Required Action B.3 and Required Action B.4 provides sufficient time for operators to accomplish the actions. The 12 hour Frequency for performing the SDM verification ensures that the reactivity changes possible with CONTROL RODS inserted are detected before SDM limits are challenged.

Required Action B.1 is modified by a Note which permits plant temperature changes provided the temperature change is accounted for in the calculated SDM. Introduction of temperature changes, including temperature increases when a positive MTC exists, must be evaluated to ensure they do not result in a loss of required SDM.

C.1

With neutron flux > 1E-10 amp on the intermediate range neutron flux instrumentation, continued operation is allowed with one or more source range neutron flux channels inoperable. The ability to continue operation is justified because the instrumentation does not provide a safety function during high power operation. However, actions are initiated within 1 hour to restore the channel(s) to OPERABLE status for future availability. The Completion Time of 1 hour is sufficient to initiate the action. The action must continue until channels are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 (continued)

CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the detector or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~The Frequency, 12 hours, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels. When operating in Required Action A.1, CHANNEL CHECK is still required. However, in this condition, a redundant source range is not available for comparison. CHANNEL CHECK may still be performed via comparison with Post Accident Monitoring source range detectors, if available, and verification that the OPERABLE source range channel is energized and indicating a value consistent with current unit status.

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.2

For source range neutron flux channels, CHANNEL CALIBRATION is a complete check and readjustment of the channels from the preamplifier input to the indicators. This test verifies the channel responds to measured parameters within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests.

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult. The detectors are of simple construction, and any failures in the detectors will be apparent as a change in channel output.

~~The Frequency of 18 months is based on demonstrated instrument CHANNEL CALIBRATION reliability over an 18 month interval, such that the instrument is not adversely affected by drift.~~

Insert 3

REFERENCES None.

BASES

ACTIONS

B.1 and B.2 (continued)

Required Action B.1 is modified by a Note which permits plant temperature changes provided the temperature change is accounted for in the calculated SDM. Introduction of temperature changes, including temperature increases when a positive MTC exists, must be evaluated to ensure they do not result in a loss of required SDM.

SURVEILLANCE REQUIREMENTS

SR 3.3.10.1

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

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

~~The Frequency, 12 hours, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

Insert 3

When operating in Required Action A.1, CHANNEL CHECK is still required. However, in this condition, a redundant intermediate range is not available for comparison. CHANNEL CHECK may still be performed via comparison with power or source range detectors, if available, and verification that the OPERABLE intermediate range channel is energized and indicates a value consistent with current unit status.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.10.2

For intermediate range neutron flux channels, CHANNEL CALIBRATION is a complete check and readjustment of the channels, from the RPS cabinet input to the indicators. This test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests.

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult. In addition, the detectors are of simple construction, and any failures in the detectors will be apparent as a change in channel output. ~~The Frequency is based on operating experience and consistency with the typical industry refueling cycle and is justified by demonstrated instrument reliability over an 18 month interval such that the instrument is not adversely affected by drift.~~

Insert 3

REFERENCES None.

ACTIONS (continued)

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

If the Required Actions cannot be met within the required Completion Time or if one or more Functions have two or more channels inoperable, the unit must be placed in a MODE or condition in which the requirement does not apply. This is done by placing the unit in a nonapplicable MODE for the particular Function. The nonapplicable MODE for all Functions except Main Steam Line Pressure - Low is MODE 4 and for Main Steam Line Pressure - Low Function is MODE 3 with main steam line pressure less than 750 psig. 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

A Note indicates that the SRs for each SFRCS instrumentation Function are identified in the SRs column of Table 3.3.11-1. SFRCS Functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, CHANNEL CALIBRATION and SFRCS RESPONSE TIME.

SR 3.3.11.1

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

Agreement criteria are determined by the unit 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 transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

SURVEILLANCE
REQUIREMENTS (continued)

SR 3.3.11.1 (continued)

~~The Frequency, 12 hours, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel operability during normal operational use of the displays associated with the LCO required channels.

Insert 3

SR 3.3.11.2

A CHANNEL FUNCTIONAL TEST verifies the function of the required trip, interlock, and alarm functions of the channel. 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 if 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. Setpoints for both trip and bypass removal functions must be found within the Allowable Value specified in the LCO. (Note that the Allowable Values for the bypass removal functions are specified in the Applicable MODES or Other Specified Condition column of Table 3.3.11-1 as limits on applicability for the trip Functions.) Any setpoint adjustment shall be consistent with the assumptions of the current unit specific setpoint analysis. The CHANNEL FUNCTIONAL TEST of the Main Steam Line Pressure - Low instrumentation includes the logic for the main steam line pressure shutdown bypasses.

~~The Frequency of 31 days is based on unit 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.~~

Insert 3

This SR is modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of the CHANNEL FUNCTIONAL TEST, entry into associated Conditions and Required Actions may be delayed for up to 8 hours, provided the channels providing input to the other actuation channel are OPERABLE. Upon completion of the Surveillance, or expiration of the 8 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This is acceptable since the channels providing input to the other actuation channel will continue to ensure the associated SFRCS Function can perform its assumed function.

SURVEILLANCE REQUIREMENTS

SR 3.3.11.2 (continued)

SR 3.3.11.2 for Functions 1, 2, and 3 are modified by two Notes as identified in Table 3.3.11-1. These Functions are an LSSS for protection system instrument channels that protect reactor core or RCS pressure boundary Safety Limits. 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. For digital channel components, the as-found tolerance may be identical to the as-left tolerance since drift may not be an expected error. In these cases, a channel as-found value outside the as-left condition may be cause for component assessment. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition for continued OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance around the Limiting Trip Setting (LTSP), or a value that is more conservative than the LTSP. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance or a setting more conservative than the LTSP, then the instrument channel shall be declared inoperable. The second Note also requires that the LTSP and the methodology used to determine the LTSP, the predefined as-found acceptance criteria band, and the as-left setpoint tolerance band are specified in the TRM (Ref. 6).

SR 3.3.11.3 and SR 3.3.11.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the unit specific setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint analysis. The CHANNEL CALIBRATION of the Main Steam Line Pressure - Low instrumentation includes the main steam line pressure shutdown bypass function.

SURVEILLANCE REQUIREMENTS

SR 3.3.11.3 and SR 3.3.11.4 (continued)

~~The Frequency for SR 3.3.11.3 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency for SR 3.3.11.4 is based on the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.~~

Insert 4

SR 3.3.11.3 for Functions 1 and 2 and SR 3.3.11.4 for Function 3 are modified by two Notes as identified in Table 3.3.11-1. These Functions are an LSSS for protection system instrument channels that protect reactor core or RCS pressure boundary Safety Limits. 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. For digital channel components, the as-found tolerance may be identical to the as-left tolerance since drift may not be an expected error. In these cases, a channel as-found value outside the as-left condition may be cause for component assessment. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition for continued OPERABILITY. The second Note requires that the as-left setting for the instrument be returned to within the as-left tolerance around the LTSP, or a value that is more conservative than the LTSP. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance or a setting more conservative than the LTSP, then the instrument channel shall be declared inoperable. The second Note also requires that the LTSP and the methodology used to determine the LTSP, the predefined as-found acceptance criteria band, and the as-left setpoint tolerance band are specified in the TRM (Ref. 6).

SR 3.3.11.5

This SR verifies individual channel actuation response times are less than or equal to the maximum value assumed in the accident analysis.

Individual component response times are not modeled in the analysis. The analysis models the overall or total elapsed time, from the point at which the parameter exceeds the actuation setpoint value at the sensor, to the point at which the end device is actuated. Thus, this SR

SURVEILLANCE REQUIREMENTS

SR 3.3.11.5 (continued)

encompasses the automatic actuation logic components covered by LCO 3.3.13, "Steam and Feedwater Rupture Control System (SFRCS) Actuation," and the operation of the mechanical components (i.e., auxiliary feedwater pumps, main steam isolation valves, main feedwater valves, and turbine stop valves). Response time testing acceptance criteria are included in the TRM (Ref. 6).

~~SFRCS RESPONSE TIME tests are conducted on a 24 month STAGGERED TEST BASIS. SFRCS RESPONSE TIME testing includes the AFW pumps for Functions 1, 2, 3, and 4, the MSIVs for Functions 1 and 2, the main feedwater isolation valves (MFCVs, SFCVs, and MFSVs) for Functions 1 and 2, and the TSVs for Function 1. Testing of the final actuation devices, which make up the bulk of the SFRCS RESPONSE TIME, is included in the testing of each channel. Therefore, staggered testing results in response time verification of these devices every 24 months. A Note requires STAGGERED TEST BASIS Frequency to be determined based on two channels per Function, in lieu of the eight total channels per Function for Functions 1, 2, and 3 and the four total channels for Function 4 specified in Table 3.3.11-1. This Frequency is based on the logic interrelationships of the various channels required to produce an SFRCS actuation. The two channels identified in the Note correspond to the two SFRCS actuation channels for each Function. The 24 month test Frequency is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~ Insert 3

REFERENCES

1. UFSAR, Section 7.4.1.3, Figure 7.4-4.
2. 10 CFR 50.49.
3. ISA RP 67.04 Part II 1994, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation."
4. ISA RP 67.04.02-2000, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation."
5. UFSAR, Table 7.4-1.
6. Technical Requirements Manual (TRM).

BASES

ACTIONS

A.1 (continued)

allotted to restore the channel allows the operator to take all the appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.3.12.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the channels can perform their intended functions. ~~The Frequency of 24 months is based on the reliability of the components.~~

Insert 3

REFERENCES

1. IEEE-279-1971, April 1972.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.13.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the channels can perform their intended functions. This test verifies MFW and Main Steam Line Isolation; AFW Initiation; and Auxiliary Feedwater and Main Steam Valve Control are functional. 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 if 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. This test simulates the required inputs to the logic circuit and verifies successful operation of the automatic actuation logic. The test need not include actuation of the end device. This is due to the risk of a unit transient caused by the closure of valves associated with MFW and Main Steam Line Isolation or actuation of AFW during testing at power. ~~The Frequency of 31 days is based on operating experience, which has demonstrated the rarity of more than one channel failing within the same 31 day interval.~~ Insert 3

This SR is modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of the CHANNEL FUNCTIONAL TEST, entry into associated Conditions and Required Actions may be delayed for up to 8 hours, provided the other actuation channel is OPERABLE. Upon completion of the Surveillance, or expiration of the 8 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This is acceptable since the other actuation channel will continue to ensure the associated SFRCS Function can perform its assumed function.

REFERENCES

1. UFSAR, Section 7.4.1.3.

BASES

APPLICABILITY

Two Fuel Handling Exhaust - High Radiation channels are required to be OPERABLE during movement of irradiated fuel assemblies in the spent fuel pool building to ensure radiation doses are within the limits of the accident analyses.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

A.1

Condition A applies when one or more channel(s) are inoperable. These radiation monitors are required to be OPERABLE in support of LCO 3.7.13, "Spent Fuel Pool Area Emergency Ventilation System (EVS)." If Condition A applies, LCO 3.7.13 Conditions and Required Actions must immediately be applied.

SURVEILLANCE REQUIREMENTS

SR 3.3.14.1

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

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the detector or the signal processing equipment has drifted outside its limit. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction.

~~The Frequency of every 12 hours is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.14.1 (continued)

~~CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

Insert 3

SR 3.3.14.2

A CHANNEL FUNCTIONAL TEST is performed on each required Fuel Handling Exhaust - High Radiation channel to ensure the entire channel will perform the intended function.

~~The Frequency of 31 days is based on unit 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.~~

Insert 3

SR 3.3.14.3

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to a setpoint specified in the Radiation Monitoring Setpoint Manual, which is significantly less than the required Trip Setpoint. This combined with the specified equipment tolerance ensures that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the unit specific setpoint and tolerance.

~~This 18 month Frequency is based on operating experience.~~

Insert 3

REFERENCES

1. UFSAR, Figure 12.1-4.
2. UFSAR, Section 15.4.7.

BASES

ACTIONS

D.1 (continued)

condition until the automatic isolation capability is returned to operation or when manual action isolates the Control Room Normal Ventilation System. The Completion Time of "Immediately" for Required Action D.1 is consistent with the urgency of the situation and accounts for the high radiation function, which provides the only automatic control room isolation function capable of responding to radiation release due to a fuel handling accident. The Completion Time does not preclude placing any fuel assembly into a safe position before ceasing any such movement.

SURVEILLANCE REQUIREMENTS

SR 3.3.15.1

SR 3.3.15.1 is the performance of a CHANNEL CHECK for the Station Vent Normal Range Radiation monitoring actuation instrumentation ~~once every 12 hours~~ to ensure that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the detector or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. ~~The Frequency, 12 hours, is based on operating experience that demonstrates channel failure is rare.~~ The CHANNEL CHECK supplements less formal but more frequent checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

Insert 3

SR 3.3.15.2

The Surveillance is modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of the required CHANNEL FUNCTIONAL TEST, entry into the associated Conditions and Required Actions may be delayed for up to 3 hours, provided the other channel is OPERABLE. Upon completion of the Surveillance, or

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.15.2 (continued)

expiration of the 3 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This is based on the average time required to perform channel surveillance. It is not acceptable to routinely remove channels from service for more than 3 hours to perform required surveillance testing.

SR 3.3.15.2 is the performance of a CHANNEL FUNCTIONAL TEST ~~once every 92 days~~ to ensure that the channels can perform their intended functions. This test verifies the capability of the instrumentation to provide the automatic control room isolation.

~~The Frequency of 92 days is based on the known reliability of the equipment and the available two channel redundancy.~~ Insert 3

SR 3.3.15.3

~~The CHANEL CALIBRATION is performed every 18 months.~~ CHANNEL CALIBRATION is a complete check of the instrument loop and the detector. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to a setpoint specified in the Radiation Monitoring Setpoint Manual, which is significantly less than the value required to isolate Control Room Normal Ventilation to control dose to the 10 CFR 20, Appendix B limits. This combined with the specified equipment accuracy ensures that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the unit specific setpoint and accuracy.

~~The Frequency of 18 months is acceptable based on operational experience.~~

Insert 3

REFERENCES 1. UFSAR, Section 9.4.1.

BASES

ACTIONS (continued)

A.1 and A.2

Condition A applies when one required channel becomes inoperable in one or more Functions.

Required Action A.1 applies to Function 3, the Output Logic Function. When one Output Logic Function channel is inoperable, the associated control rod drive trip breaker must be tripped within 1 hour. This ensures the function of the output logic is met.

Required Action A.2 applies to Functions 1 and 2, the Turbine Trip and Trip of Both Feed Pump Turbines Functions. When one required channel of either of these Functions is inoperable, the inoperable channel must be restored to OPERABLE status within 72 hours. While in this condition, the remaining two channels of the associated Function can still cause a reactor trip, however, redundancy is lost since an additional single failure in the Function will result in loss of ARTS capability from the Function.

B.1 and B.2

When Required Action A.1 or A.2 is not met within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, THERMAL POWER must be reduced to ≤ 45% RTP within 6 hours (for Function 1) and the unit must be brought to at least MODE 2 within 6 hours (for Functions 2 and 3). 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

The SRs for each ARTS Function are identified by the SRs column of Table 3.3.16-1 for that Function. The SRs are modified by a Note. The Note directs the reader to Table 3.3.16-1 to determine the correct SRs to perform for each ARTS Function.

SR 3.3.16.1

Performance of the CHANNEL CHECK ~~every 12 hours~~ ensures a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.16.1 (continued)

one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the detector or the signal processing equipment has drifted outside its limit. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction.

~~The Frequency of every 12 hours is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

Insert 3

SR 3.3.16.2

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

~~The Frequency of 23 days on a STAGGERED TEST BASIS for Function 3 is consistent with the calculations of Reference 3 that indicate the ARTS Output Logic Function retains a high level of reliability for this test interval.~~

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.16.3

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the unit specific setpoint and tolerance.

~~The Frequency of 46 days on a STAGGERED TEST BASIS for Functions 1 and 2 is consistent with the calculations of Reference 4 that indicate the ARTS sensors retain a high level of reliability for this test interval. For this SR, *n* equals 4, since there are 4 total channels per Function.~~

Insert 3

REFERENCES

1. NUREG-0737, November 1979.

2. UFSAR, Section 7.4.1.4 and Figure 7.4-8.

3. NRC SER for BAW-10167, Supplement 3, January 7, 1998.

4. NRC SER for BAW-10167, Supplement 2, July 8, 1992.

BASES

ACTIONS

E.1 (continued)

and MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

F.1

At this unit, alternative means of monitoring Containment High Range Radiation have been developed and tested. These alternative means may be temporarily used if the normal PAM channel cannot be restored to OPERABLE status within the allowed time.

If these alternative means are used, the Required Action is not to shut the unit down, but rather to follow the directions of Specification 5.6.5, in the Administrative Controls section of the Technical Specifications. The report provided to the NRC should discuss the alternative means used, describe the degree to which the alternative means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

At this unit, the alternative monitoring provisions consist of the Containment Vessel Area Radiation Elements or Containment Normal Range Noble Gas Channels.

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs apply to each PAM instrumentation Function in Table 3.3.17-1 except as stated in the SR.

SR 3.3.17.1

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.17.1 (continued)

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~The Frequency is based on unit 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 this LCO's required channels.

Insert 3

SR 3.3.17.2

~~A CHANNEL CALIBRATION is performed every 18 months.~~ CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. This test verifies the channel responds to measured parameters within the necessary range and accuracy.

A Note clarifies that the neutron detectors are not required to be tested as part of the CHANNEL CALIBRATION. There is no adjustment that can be made to the detectors. Furthermore, adjustment of the detectors is unnecessary because they are passive devices, with minimal drift.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the Incore Thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

~~The Frequency is based on operating experience and is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift.~~

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.17.3

~~A CHANNEL CALIBRATION is performed every 24 months.~~ CHANNEL CAILIBRATION is a complete check of the instrument channel, including the sensor. This test verifies the channel responds to measured parameters within the necessary range and accuracy.

For the Containment High Range Radiation Monitors, a CHANNEL CALIBRATION may 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 a gamma source.

~~The Frequency is based on operating experience and consistency with the typical industry refueling cycle and is justified by an assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift.~~

Insert 3

REFERENCES

1. UFSAR, Section 7.13.

2. Regulatory Guide 1.97.

3. NUREG-0737, 1979.

BASES

ACTIONS

B.1 and B.2 (continued)

6 hours and to MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1

Required Action C.1 specifies immediate initiation of action described in Specification 5.6.7, "Remote Shutdown System Report," which requires a written report to be submitted to the NRC. This report discusses the evaluation into the cause of the inoperability and identifies proposed restorative actions. This action is appropriate in lieu of a shutdown requirement since the control circuits and transfer switches are related to meeting 10 CFR 50, Appendix R requirements. The Completion Time of "Immediately" ensures the requirements of Specification 5.6.7 are initiated.

SURVEILLANCE REQUIREMENTS

SR 3.3.18.1

Performance of the CHANNEL CHECK ~~once every 31 days~~ for each required instrumentation channel that is normally energized ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value.

Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. Agreement criteria are determined by the unit staff based on a combination of the channel instrument uncertainties, including indication and readability. If the channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. As specified in the Surveillance, a CHANNEL CHECK is only required for those channels that are normally energized. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.18.1 (continued)

are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~The Frequency is based on unit operating experience, which demonstrates that channel failure is rare.~~ Insert 3

SR 3.3.18.2

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

Whenever a resistance temperature detector (RTD) is replaced, the next required CHANNEL CALIBRATION of the RTD sensor is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

~~The Frequency is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift.~~ Insert 3

SR 3.3.18.3

SR 3.3.18.3 verifies each control circuit and transfer switch required for a serious control room fire or cable spreading room fire performs their intended function. This verification is performed from the remote shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel or remotely is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if a serious control room or cable spreading room fire occurs, the requirement of the Fire Protection Program can be met. ~~The 24 month frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience demonstrates that these control circuits and transfer switches seldom fail to pass the Surveillance when performed at the 24 month Frequency.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the ~~12 hour~~ Surveillance Frequency for loop (hot leg) pressure is sufficient to ensure that the pressure can be restored to a normal operation, steady state condition following load changes and other expected transient operations. The RCS pressure value specified is dependent on the number of pumps in operation and has been adjusted to account for the pressure loss difference between the core exit and the measurement location. The value used in the plant safety analysis is 2200 psia (nominal). ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify operation is within safety analysis assumptions.~~

A Note has been added to indicate the pressure limits are to be applied to the loop with two pumps in operation for the three pump operating condition.

Insert 3

SR 3.4.1.2

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

Insert 3

A Note has been added to indicate the temperature limits are to be applied to the loop with two pumps in operation for the three pump operating condition.

Surveillance

SR 3.4.1.3

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

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.1.4

Measurement of RCS total flow rate by performance of a precision calorimetric heat balance ~~once every 18 months~~ allows the installed RCS flow instrumentation to be calibrated and verifies that the actual RCS flow is greater than or equal to the minimum required RCS flow rate. These minimum required measured flows include a flow rate uncertainty of 2.5%

~~The Frequency of 18 months is considered adequate for ensuring accurate RCS flow measurement instrumentation and has been shown by operating experience to be acceptable.~~ Insert 3

The Surveillance is modified by a Note that indicates the SR is not required to be performed until 24 hours after stable thermal conditions are established at ≥ 70% RTP. The Note is necessary to allow measurement of the flow rate at normal operating conditions at power in MODE 1. The Surveillance cannot be performed at low power or in MODE 2 or below because at low power the ΔT across the core will be too small to provide valid results.

REFERENCES

1. UFSAR, Section 15.

2. UFSAR, Appendix 4B.

BASES

ACTIONS

A.1

With T_{avg} below 525°F, 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 2 with k_{eff} < 1.0 in 30 minutes. Rapid reactor shutdown can be readily and practically achieved in a 30 minute period. The Completion Time reflects the ability to perform this action and maintain the plant within the analyzed range. If T_{avg} can be restored within the 30 minute time period, shutdown is not required.

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1

periodically

RCS loop average temperature is required to be verified at or above 525°F ~~every 12 hours. The SR to verify RCS loop average temperatures every 12 hours takes into account indications and alarms that are continuously available to the operator in the control room and is consistent with other routine Surveillances which are typically performed once per shift.~~ In addition, operators are trained to be sensitive to RCS temperature during approach to criticality and will ensure that the minimum temperature for criticality is met as criticality is approached.

Insert 3

REFERENCES

1. UFSAR, Section 15.2.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

Verification that operation is within the PTLR limits is required ~~every 30 minutes~~ when RCS pressure and temperature conditions are undergoing planned changes.

~~This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature rate of change limits are specified in hourly increments, 30 minutes permits assessment and correction for minor deviations within a reasonable time.~~

Insert 3

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

This SR is modified by a Note that requires this SR to be performed only during system heatup, cooldown, and ISLH testing.

REFERENCES

1. Deleted (see CN# 11-040)
2. 10 CFR 50, Appendix G.
3. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
4. Regulatory Guide 1.99, Revision 2, May 1988.
5. NUREG-0800, Section 5.3.1, Rev. 1, July 1981.
6. ASTM E 185-82, July 1982.
7. 10 CFR 50, Appendix H.
8. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

BASES

ACTIONS

B.1 (continued)

plant to MODE 3. This lowers power level and thus reduces the core heat removal needs and minimizes the possibility of violating DNB limits.

The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

This SR requires verification ~~every 12 hours~~ of the required number of loops in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal while maintaining the margin to DNB. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess degradation and verify operation within safety analyses assumptions. In addition, control room indication and alarms will normally indicate loop status.~~

Insert 3

REFERENCES

1. UFSAR, Section 15.2.5.

BASES

ACTIONS (continued)

B.1

If restoration of an RCS loop as required in Required Action A.1 is not possible within 72 hours, the unit must be brought to MODE 4. In MODE 4, the plant may be placed on the DHR System. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to achieve cooldown and depressurization from the existing plant conditions and without challenging plant systems.

C.1 and C.2

If two RCS loops are inoperable or a required RCS loop is not in operation, all operations involving introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be immediately suspended. Action to restore one RCS loop to operation shall be immediately initiated and continued until one RCS loop is restored to OPERABLE status and to operation. Suspending the introduction of coolant into the RCS of coolant with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operation for decay heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR requires verification ~~every 12 hours~~ that the required loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced or natural circulation flow is providing heat removal. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess RCS loop status.~~ In addition, control room indication and alarms will normally indicate loop status.

Insert 3

SR 3.4.5.2

SR 3.4.5.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side water level is either ≥ 18 inches above the lower tube sheet when the associated reactor coolant pump is operating (forced flow) or ≥ 35 inches above the lower

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.5.2 (continued)

tube sheet if reactor coolant pumps are not operating (natural circulation flow). If the SG water level is not within the associated limit, it may not be capable of providing the heat sink necessary for removal of decay heat. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.~~ Insert 3

SR 3.4.5.3

Verification that each required RCP is OPERABLE ensures that the single failure criterion is met and that an additional RCS loop can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power availability to each required pump. Alternatively, verification that a pump is in operation also verifies proper breaker alignment and power availability. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~ Insert 3

This SR is modified by a Note that states the SR is not required to be performed until 24 hours after a required pump is not in operation.

REFERENCES None.

BASES

ACTIONS

B.1 and B.2 (continued)

LCO 3.1.1 must be suspended and action to restore one RCS or DHR loop to OPERABLE status and operation must be initiated. The required margin to criticality must not be reduced in this type of operation. Suspending the introduction of coolant, into the RCS, with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to ensure continued safe operation. With coolant added without circulation, unmixed coolant could be introduced to the core, however, coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal. The action to restore must continue until one loop is restored to operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This Surveillance requires verification ~~every 12 hours~~ of the required DHR or RCS loop in operation to ensure forced or natural circulation flow is providing decay heat removal. Verification includes flow rate, temperature, or pump status monitoring. If forced flow using the DHR loop is used to meet this requirement, the flow rate shall be ≥ 2800 gpm. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess RCS loop status.~~ In addition, control room indication and alarms will normally indicate loop status.

Insert 3

SR 3.4.6.2

SR 3.4.6.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side water level is either ≥ 18 inches above the lower tube sheet when the associated reactor coolant pump is operating (forced flow) or ≥ 35 inches above the lower tube sheet if reactor coolant pumps are not operating (natural circulation flow). If the SG water level is not within the associated limit, it may not be capable of providing the heat sink necessary for removal of decay heat. ~~The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.~~

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.6.3

Verification that each required pump is OPERABLE ensures that an additional RCS or DHR loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to each required pump. Alternatively, verification that a pump is in operation also verifies proper breaker alignment and power availability. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls and has been shown to be acceptable by operating experience.~~ Insert 3

This SR is modified by a Note that states the SR is not required to be performed until 24 hours after a required pump is not in operation.

REFERENCES None.

BASES

ACTIONS (continued)

B.1 and B.2

If no required loop is in operation, or no required loop is OPERABLE, all operations involving introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be suspended and action to restore a loop to OPERABLE status and operation must be initiated. The required margin to criticality must not be reduced in this type of operation. Suspending the introduction of coolant into the RCS of coolant with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operation for decay heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification ~~every 12 hours~~ that the required RCS or DHR loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced or natural circulation flow is providing heat removal. If forced flow using the DHR loop is used to meet this requirement, the flow rate shall be ≥ 2800 gpm. ~~The 12 hour Frequency has been shown by operating practice to be sufficient to regularly assess degradation.~~ In addition, control room indication and alarms will normally indicate loop status.

Insert 3

SR 3.4.7.2

Verifying the required SGs are OPERABLE by ensuring their secondary side water levels are ≥ 35 inches above the lower tube sheet ensures that redundant heat removal paths are available. If both DHR loops are OPERABLE, this Surveillance is not needed. ~~The 12 hour Frequency has been shown by operating practice to be sufficient to regularly assess degradation and verify operation.~~

Insert 3

SR 3.4.7.3

Verification that each required DHR pump is OPERABLE ensures that redundant paths for heat removal are available. The requirement also ensures that the additional loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. If the secondary side water level is ≥ 35 inches above the lower tube sheet in

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.7.3 (continued)

both SGs, this Surveillance is not needed. Verification is performed by verifying proper breaker alignment and power available to each required pump. Alternatively, verification that a pump is in operation also verifies proper breaker alignment and power availability. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~

Insert 3

This SR is modified by a Note that states the SR is not required to be performed until 24 hours after a required pump is not in operation.

REFERENCES None.

BASES

ACTIONS (continued)

B.1 and B.2

If no required loop is OPERABLE or the required loop is not in operation, except as provided by Note 1 in the LCO, the Required Actions require immediate suspension of all operations involving introduction of coolant into the RCS with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 and immediate initiation of action to restore one DHR loop to OPERABLE status and operation. Suspending the introduction of coolant into the RCS of coolant with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Time reflects the importance of maintaining operations for decay heat removal. The action to restore must continue until one loop is restored.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This Surveillance requires verification ~~every 12 hours~~ that the required loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. If the DHR loop is used to meet this requirement, the flow rate shall be ≥ 2800 gpm. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess degradation and verify operation within safety analyses assumptions.~~ Insert 3

SR 3.4.8.2

Verification that each required pump is OPERABLE ensures that redundancy for heat removal is provided. The requirement also ensures that an additional loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to each required pump. Alternatively, verification that a pump is in operation also verifies proper breaker alignment and power availability. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~ Insert 3

This SR is modified by a Note that states the SR is not required to be performed until 24 hours after a required pump is not in operation.

REFERENCES

1. Generic Letter 88-17, October 17, 1988.

BASES

ACTIONS (continued)

D.1 and D.2

If essential pressurizer heater capability cannot be restored within the allowed Completion Time of Required Action C.1, 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 6 hours and to MODE 4 within 12 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. Similarly, the Completion Time of 12 hours to reach MODE 4 is reasonable based on operating experience to achieve power reduction from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This SR requires that during steady state operation, pressurizer water level is maintained below the nominal upper limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess the level for any deviation and verify that operation is within safety analyses assumptions. Alarms are also available for early detection of abnormal level indications.~~ Insert 3

SR 3.4.9.2

The SR requires the power supplies are capable of producing the minimum power and the essential pressurizer heaters are verified to be at their design rating. (This may be done by testing the power supply output and by performing an electrical check on heater element continuity and resistance.) ~~The Frequency of 24 months is considered adequate to detect heater degradation and has been shown by operating experience to be acceptable.~~ Insert 3

REFERENCES

1. NUREG-0737, November 1980.

BASES

ACTIONS (continued)

B.1 and B.2

If the block valve is inoperable, it must be restored to OPERABLE status within 1 hour. The prime importance for the capability to close the block valve is to isolate a stuck open PORV. Therefore, if the block valve cannot be restored to OPERABLE status within 1 hour, the Required Action is to close the block valve and remove power within 1 hour rendering the PORV isolated. The 1 hour Completion Times are consistent with an allowance of some time for correcting minor problems, restoring the valve to operation, and establishing correct valve positions and restricting the time without adequate protection against RCS depressurization.

C.1 and C.2

If the Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. The 6 hours allowed is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. Similarly, the 12 hours allowed is reasonable, based on operating experience, to reach MODE 4 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Block valve cycling verifies that it can be closed if needed. ~~The basis for the Frequency of 92 days is the ASME Code (Ref. 4).~~ Block valve cycling, as stated in the Note, is not required to be performed when it is closed for isolation; cycling could increase the hazard of an existing degraded flow path.

Insert 3

SR 3.4.11.2

PORV cycling demonstrates its function. Any combination of indications (e.g., acoustic, system response) may be used to confirm a complete cycle of the PORV. ~~The Frequency of 24 months is based on a typical refueling cycle and industry accepted practice.~~

Insert 3

BASES

ACTIONS

D.1, D.2, D.3, and D.4 (continued)

must be verified to be in the Acceptable Region of Figure 3.4.12-1 or 3.4.12-2 (depending on the MODE) within 8 hours to ensure an overpressure condition cannot occur. These Figures do not include instrument error uncertainties.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1

Verification of the flow path from the RCS to the DHR System relief valve is required ~~every 24 hours.~~ This verification is performed by checking RCS to DHR System isolation valves in the open position with control power removed from the valve operator. This Surveillance ensures the overpressure relief flow path is aligned and remains aligned. Removal of control power ensures the flow path is not inadvertently closed.

~~The Frequency is adequate based on operating experience. Manual operation is required to close the isolation valves or energize control power. Valve operations are administratively controlled by procedure. In this configuration the isolation valves will not inadvertently close.~~

Insert 3

SR 3.4.12.2

Verification of the DHR System relief valve lift setpoint must be performed to ensure LTOP requirements can be met. Overpressure protection of the RCS is ensured by the DHR System relief valve, which relieves pressure and prevents the RCS from exceeding the Pressure/Temperature Limits.

The DHR System relief valve setpoint is verified in accordance with the INSERVICE TESTING PROGRAM for proper operation and correct lift setting of ≤ 330 psig. This lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure. The INSERVICE TESTING PROGRAM specifies the testing and frequency, as directed by ASME Code.

REFERENCES

1. 10 CFR 50, Appendix G.

2. Generic Letter 88-11.

3. UFSAR, Section 9.3.5.

BASES

APPLICABILITY (continued)

LCO 3.4.14, "RCS Pressure Isolation Valve (PIV) Leakage," measures leakage through each individual PIV and can impact this LCO. Of the two PIVs in series in each isolated line, leakage measured through one PIV does not result in RCS LEAKAGE when the other is leaktight. If both valves leak and result in a loss of mass from the RCS, the loss must be included in the allowable identified LEAKAGE.

ACTIONS

A.1

If unidentified LEAKAGE or identified LEAKAGE are in excess of the LCO limits, the LEAKAGE must be reduced to within limits within 4 hours. This Completion Time allows time to verify leakage rates and either identify unidentified LEAKAGE or reduce LEAKAGE to within limits before the reactor must be shut down. This action is necessary to prevent further deterioration of the RCPB.

B.1 and B.2

If any pressure boundary LEAKAGE exists or primary to secondary LEAKAGE is not within limit, or if unidentified or identified LEAKAGE cannot be reduced to within limits within 4 hours, the reactor must be brought to lower pressure conditions to reduce the severity of the LEAKAGE and its potential consequences. The reactor must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. This action reduces the LEAKAGE and also reduces the factors that tend to degrade the pressure boundary.

The Completion Times allowed are reasonable, based on operating experience, to reach the required conditions from full power conditions in an orderly manner and without challenging plant systems. In MODE 5, the pressure stresses acting on the RCPB are much lower and further deterioration is much less likely.

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1

Verifying RCS LEAKAGE within the LCO limits ensures that the integrity of the RCPB is maintained. Pressure boundary LEAKAGE would at first appear as unidentified LEAKAGE and can only be positively identified by inspection. Unidentified LEAKAGE and identified LEAKAGE are determined by performance of an RCS water inventory balance.

The RCS water inventory balance must be performed with the reactor at steady state operating conditions (stable temperature, power level, and pressurizer level). The accuracy of the results will be impacted if any

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

measured parameter used to calculate the RCS LEAKAGE is not in a steady state condition.

The Surveillance is modified by two Notes. Note 1 states that this SR is not required to be performed until 12 hours after establishing steady state operation. The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

An early warning of pressure boundary LEAKAGE or unidentified LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level. These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

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

~~The 72 hour Frequency is a reasonable interval to trend LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents.~~ Insert 3

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less than or equal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, compliance with LCO 3.4.17, "Steam Generator Tube Integrity," should be evaluated. The 150 gallons per day limit is measured at room temperature as described in Reference 5. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

The Surveillance is modified by a Note which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable power level (± 1%).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.2 (continued)

~~The Surveillance Frequency of 72 hours is a reasonable interval to trend primary to secondary LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents.~~ The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 5).

Insert 3

REFERENCES

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

BASES

ACTIONS

A.1 and A.2 (continued)

Required Action A.2 specifies that the double isolation barrier of two valves be restored by closing some other valve qualified for isolation or restoring one leaking PIV. The 72 hour time after exceeding the limit considers the time required to complete the Action and the low probability of a second valve failing during this time period.

B.1 and B.2

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

C.1 and C.2

The inoperability of the DHR System interlock function renders the DHR suction isolation valves incapable of isolating in response to a high pressure condition and preventing inadvertent opening of the valves at RCS pressures in excess of the DHR systems design pressure. If the DHR interlock is inoperable, operation may continue as long as the DHR suction line is isolated by two closed and deactivated automatic valves within 4 hours. This action accomplishes the purpose of the interlock function.

Alternately, if the RCS pressure is < 328 psig, isolating the associated DHR penetration is not required. In this case, the DHR System interlock function must be restored to OPERABLE status prior to increasing RCS pressure ≥ 328 psig. Since RCS pressure is below the setpoint, there is no need to isolate the associated penetration.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

SR 3.4.14.1 is the performance of the CHANNEL CHECK of the decay heat isolation valve interlock channel that is common to the Safety Features Actuation System (SFAS) instrumentation. The check provides

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1 (continued)

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 3

SR 3.4.14.2

Performance of leakage testing on each RCS PIV or isolation valve used to satisfy Required Action A.1 or A.2 is required to verify that leakage is below the specified limit and to identify each leaking valve. The RCS PIV leakage limit is ≤ 5.0 gpm. However, RCS PIV leakage is also limited when the current measured rate is > 1.0 gpm, such that the current measured rate shall not exceed the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and 5.0 gpm by 50%. Leakage testing requires a stable pressure condition. Valves CF-30 and CF-31 will be tested with the RCS pressure > 1200 psig and valves DH-76 and DH-77 will be tested at > 575 psig (i.e., the normal core flooding tank pressure). Minimum differential test pressure across each valve shall be > 150 psid. Additionally, to satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

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

~~Testing is to be performed every 24 months, a typical refueling cycle, if the plant does not go into MODE 5 for at least 7 days. The 24 month Frequency is consistent with 10 CFR 50.55a(g) (Ref. 8) as contained in the INSERVICE TESTING PROGRAM, is within frequency allowed by the American Society of Mechanical Engineers (ASME) Code (Ref. 7), and is based on the need to perform such surveillances under conditions that apply during an outage and the potential for an unplanned transient if the Surveillance were performed with the plant at power.~~ Insert 3

The leakage limit is to be performed at the RCS pressure associated with MODES 1 and 2. This permits leakage testing at high differential pressures with stable conditions not possible in the MODES with lower

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.2 (continued)

pressures. Entry into MODES 3 and 4 is allowed to establish the necessary differential pressures and stable conditions to allow for performance of this Surveillance. The Note that allows this provision is complimentary to the Frequency of prior to entry into MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months.

SR 3.4.14.3 and SR 3.4.14.4

Verifying that the DHR interlocks are OPERABLE ensures that RCS pressure will not pressurize the DHR system beyond 430 psig, the pressure at which this section of DHR piping was tested. The interlock setpoint that prevents the valves from being opened is set so the actual RCS pressure must be < 328 psig at the RCS pressure instrumentation tap to open the valves. This setpoint allows DH-11 and DH-12 to be opened by the operator prior to the point where net positive suction pressure is lost to the reactor coolant pumps. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance was performed with the reactor at power. The 24 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.~~ Insert 4

These SRs are modified by Notes allowing the DHR System interlock function to be disabled when using the DHR System suction relief valve for cold overpressure protection in accordance with LCO 3.4.12. This allowance is necessary since opening and removing control power to the DHR System isolation valves (as required by LCO 3.4.12) disables the interlock.

SR 3.4.14.5

SR 3.4.14.5 requires the performance of a CHANNEL CALIBRATION of the DHR System interlock channels (both the channel common to SFAS instrumentation and the channel not common to SFAS instrumentation). The calibration verifies the accuracy of the instrument string. ~~The Frequency of 24 months is a typical refueling cycle and considers channel reliability. Operating experience has proven this Frequency is acceptable.~~ Insert 3

BASES

ACTIONS

C.1 and C.2 (continued)

must be taken to provide alternate periodic information. The 12 hour interval is sufficient to detect increasing RCS leakage. The Required Action provides 7 days to restore another RCS leakage monitor to OPERABLE status to regain the intended leakage detection diversity. The 7 day Completion Time ensures that the plant will not be operated in a degraded configuration for a lengthy time period.

D.1 and D.2

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

E.1

With both required monitors inoperable, no automatic means of monitoring leakage are available, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that each channel is operating properly. ~~The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.~~ Insert 3

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a CHANNEL FUNCTIONAL TEST of the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. ~~The Frequency of 31 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. ~~The Frequency of 18 months or 24 months, as applicable, considers channel reliability and, operating experience has proven this Frequency is acceptable.~~ Insert 4

BASES

ACTIONS

A.1 and A.2

With the DOSE EQUIVALENT I-131 greater than the LCO limit, samples at intervals of 4 hours must be taken to verify the limits of Figure 3.4.16-1 are not exceeded. An isotopic analysis of a reactor coolant sample must be performed for at least I-131, I-133, and I-135. The Completion Time of 4 hours is required to obtain and analyze a sample. Sampling must continue for trending.

The DOSE EQUIVALENT I-131 must be restored to limits within 48 hours. The Completion Time of 48 hours is required, if the limit violation resulted from normal iodine spiking.

A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE(S) while relying on the ACTIONS. This allowance is acceptable due to the significant conservatism incorporated into the specific activity limit, the low probability of an event which is limiting due to exceeding this limit, and the ability to restore transient specific activity excursions while the plant remains at, or proceeds to power operation.

B.1

If a Required Action and associated Completion Time of Condition A are not met, if the DOSE EQUIVALENT I-131 is in the unacceptable region of Figure 3.4.16-1, or if the gross specific activity is not within limit, the reactor must be brought to MODE 3 with RCS average temperature < 530°F within 6 hours. The Completion Time of 6 hours is required to get to MODE 3 below 530°F without challenging reactor emergency systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the gross specific activity of the reactor coolant ~~at least once per 7 days~~. While basically a quantitative measure of radionuclides with half lives longer than 15 minutes, excluding iodines, this measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in gross specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The Surveillance is applicable in MODES 1 and 2, and in MODE 3 with RCS average temperature at least 530°F. ~~The 7 day Frequency considers the unlikelihood of a gross fuel failure during that time period.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.16.2

This Surveillance requires the verification that the reactor coolant DOSE EQUIVALENT I-131 specific activity is within limit. This Surveillance is accomplished by performing an isotopic analysis of a reactor coolant sample. This Surveillance is performed in MODE 1 only to ensure the iodine remains within limit during normal operation and following fast power changes when fuel failure is more apt to occur. ~~The 14 day Frequency is adequate to trend changes in the iodine activity level considering gross specific activity is monitored every 7 days.~~ The Frequency, between 2 and 6 hours after a power change of ≥ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following fuel failure; samples at other times would provide inaccurate results.

Insert 3

SR 3.4.16.3

SR 3.4.16.3 requires radiochemical analysis for Ē determination ~~every 184 days~~ with the plant operating in MODE 1 equilibrium conditions. The Ē determination directly relates to the LCO and is required to verify plant operation within the specific gross activity LCO limit. The analysis for Ē is a measurement of the average energies per disintegration for isotopes with half lives longer than 15 minutes, excluding iodines. ~~The Frequency of 184 days recognizes Ē does not change rapidly.~~

Insert 3

This SR has been modified by a Note that states sampling is not required to be performed until 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for at least 48 hours. This ensures the radioactive materials are at equilibrium so the analysis for Ē is representative and not skewed by a crud burst or other similar abnormal event.

REFERENCES

1. 10 CFR 100.11.

2. UFSAR, Section 15.4.2.

BASES

ACTIONS (continued)

D.1

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

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Verification ~~every 12 hours~~ that each CFT isolation valve is fully open, as indicated in the control room, ensures that the CFTs are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in accident analysis assumptions not being met. ~~A 12 hour Frequency is considered reasonable in view of administrative controls that ensure that a mispositioned isolation valve is unlikely.~~

Insert 3

SR 3.5.1.2 and SR 3.5.1.3

Verification ~~every 12 hours~~ of each CFT's nitrogen cover pressure and the borated water volume is sufficient to ensure adequate injection during a LOCA. ~~Due to the static design of the CFTs, a 12 hour Frequency usually allows the operator to identify changes before the limits are reached. Operating experience has shown that this Frequency is appropriate for early detection and correction of off normal trends.~~

Insert 4

SR 3.5.1.4

Surveillance ~~once every 31 days~~ is reasonable to verify that the CFT boron concentration is within the required limits, because the static design of the CFT limits the ways in which the concentration can be changed. ~~The Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage.~~ Sampling within 6 hours after an 80 gallon volume increase will identify whether inleakage from the RCS has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the borated water storage tank (BWST), because the water contained in the BWST is within CFT boron concentration requirements. This is consistent with the recommendations of NUREG-1366 (Ref. 3).

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.5

Verification ~~every 31 days~~ that power is removed from each CFT isolation valve operator (by locking the breaker in the open position) ensures that an active failure could not result in the undetected closure of a CFT motor operated isolation valve coincident with a LOCA. If this closure were to occur and the postulated LOCA is a rupture of the redundant CFT inlet piping, CFT capability would be rendered inoperable. The rupture would render the tank with the open valve inoperable, and a closed valve on the other CFT would likewise render it inoperable. This would cause a loss of function for the CFTs. ~~Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that the power is removed.~~

Insert 3

REFERENCES

1. UFSAR, Section 6.3.

2. 10 CFR 50.46.

3. NUREG-1366, December 1992.

BASES

ACTIONS (continued)

C.1 and C.2

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

D.1

Condition B is applicable with one or more trains inoperable. The allowed Completion Time is based on the assumption that at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train is available. With less than 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available, the facility is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

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 actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control, and an inoperable valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.~~ Insert 3

SR 3.5.2.2

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code (Ref. 5). This type of testing may be accomplished by measuring the pump's developed head at only one point of the pump's characteristic curve. This verifies both that the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.2 (continued)

measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant accident analysis. SRs are specified in the Inservice Testing Program of the ASME Code. The ASME Code provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.3

With the exception of systems in operation, the ECCS pumps are normally in a standby, nonoperating mode. As such, the flow path piping has the potential to develop voids and pockets of entrained gases. This SR requires maintaining the piping from the ECCS pumps to the RCS full of water, by venting the ECCS pump casings and discharge piping high points, to ensure that the system will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SFAS signal or during shutdown cooling. ~~The 24 month Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping, the existence of procedural controls governing system operation, and the fact that some venting point are not accessible during normal operation.~~ The second Frequency is required to ensure the ECCS subsystem is refilled after draining prior to declaring the ECCS subsystem OPERABLE.

Insert 3

SR 3.5.2.4 and SR 3.5.2.5

These SRs demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SFAS signal and that each ECCS pump starts on receipt of an actual or simulated SFAS signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 24 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.~~ The actuation logic is tested as part of the SFAS testing, and equipment performance is monitored as part of the INSERVICE TESTING PROGRAM.

Insert 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.6

This Surveillance verifies the position of each mechanical stop for valves DH-14A and DH-14B is correct to ensure that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, provide the proper flow split between injection points in accordance with the assumptions used in the LOCA analyses, and provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the LOCA analyses. ~~The 24 month Frequency is justified by the same reasons as those stated for SR 3.5.2.4 and SR 3.5.2.5.~~

Insert 3

SR 3.5.2.7

Periodic inspections of the containment sump suction inlet ensure that it is unrestricted and stays in proper operating condition. In addition, the screen components include the vertical strainers. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, on the need to preserve access to the location, and on the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency has been found to be sufficient to detect abnormal degradation and has been confirmed by operating experience.~~

Insert 3

SR 3.5.2.8

This Surveillance verifies that the BWST outlet valve (HV-DH7A and HV-DH7B) automatically closes after the operator manually pushes the control switch to open the containment emergency sump valve (HV-DH9A and HV-DH9B), and the containment emergency sump valve opens, following receipt of a Borated Water Storage Tank Level – Low Low signal (i.e., Table 3.3.5-1, Function 5). This SR also verifies each valve's closure or opening time, as applicable, is $\leq$ 75 seconds. The closure and opening times are measured from when the operator pushes the control switch for the associated containment emergency sump valve until the valve is either fully open or closed, as applicable. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage.~~

Insert 3

BASES

ACTIONS (continued)

C.1 and C.2

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

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

Verification ~~every 24 hours~~ that the BWST water temperature is within the specified temperature band ensures that the boron will not precipitate; the containment vessel vacuum breaker sizing assumption is met; and the fluid temperature entering the reactor vessel will not be hotter than assumed in the LOCA analysis. ~~The 24 hour Frequency is sufficient to identify a temperature change that would approach either temperature limit and has been shown to be acceptable through operating experience.~~

Insert 3

The SR is modified by a Note that requires the Surveillance to be performed only when ambient air temperatures are outside the operating temperature limits of the BWST. With ambient temperatures within this band, the BWST temperature should not exceed the limits.

SR 3.5.4.2

Verification ~~every 7 days~~ that the BWST available volume is within the required range ensures that a sufficient initial supply is available for injection and to support continued ECCS pump operation on recirculation. The limits on water volume reflect the available volume since a portion of the contained volume of the BWST is not available because of the tank discharge configuration. ~~Since the BWST volume is normally stable and provided with a low level alarm, a 7 day Frequency has been shown to be appropriate through operating experience.~~

Insert 3

SR 3.5.4.3

Verification ~~every 7 days~~ that the boron concentration of the BWST fluid is within the required band ensures that the reactor will remain subcritical following a LOCA. ~~Since the BWST volume is normally stable, a 7 day sampling Frequency is appropriate and has been shown to be acceptable through operating experience.~~

Insert 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1 (continued)

air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by the Containment Leakage Rate Testing Program.

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable, since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria which is applicable to SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C containment leakage rate.

SR 3.6.2.2

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

Insert 3

BASES

ACTIONS (continued)

E.1 (continued)

exceeded by use of one closed and deactivated automatic valve, closed manual valve, or blind flange. When a penetration is isolated the leakage rate for the isolated penetration is assumed to be the actual pathway leakage through the isolation device. If two isolation devices are used to isolate the penetration, the leakage rate is assumed to be the lesser actual pathway leakage of the two devices. The 4 hour Completion Time for secondary bypass leakage not within limit is reasonable considering the time required to restore the leakage by isolating the penetration(s) and the relative importance of secondary containment bypass leakage to the overall containment function.

F.1 and F.2

If the Required Actions and associated Completion Times 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 6 hours and to MODE 5 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 3.6.3.1

This SR requires e

periodically

~~E~~ach 48 inch containment purge and exhaust valve is required to be verified closed with control power removed ~~at 31 day intervals~~. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a containment purge or exhaust valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the closed position with control power removed during MODES 1, 2, 3, and 4. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator.

Insert 3

SR 3.6.3.2

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2 (continued)

outside containment and capable of being mispositioned are in the correct position. ~~Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions.~~ The SR specifies that containment isolation valves open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

Insert 3

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

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. For containment isolation valves inside containment, the Frequency of "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is appropriate, since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. The SR specifies that containment isolation valves open under administrative controls are not required to meet the SR during the time they are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.6

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass this Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ Insert 3

SR 3.6.3.7

This SR ensures that the combined leakage rate of all secondary containment bypass leakage paths is less than or equal to the specified leakage rate. This provides assurance that the assumptions in the safety analysis are met. The leakage rate acceptance criteria is in accordance with the Containment Leakage Rate Testing Program requirements, 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 Containment Leakage Rate Testing Program. This SR simply imposes additional acceptance criteria. Bypass leakage is considered part of L_a.

REFERENCES

1. 10 CFR 20.
2. UFSAR, Section 3.8.2.1.2.
3. UFSAR, Section 15.4.
4. UFSAR, Table 6.2-23.

BASES

ACTIONS

B.1 and B.2 (continued)

operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1

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

Insert 3

REFERENCES

1. UFSAR, Section 3.11.2.
2. UFSAR, Section 3.8.2.1.4.
3. 10 CFR 50, Appendix K.

BASES

LCO

During a DBA, with an initial containment average air temperature less than or equal to the LCO temperature limit, the resultant accident temperature profile assures that the containment structural temperature is maintained below its design temperature and that required safety related equipment will continue to perform its function.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining containment average air temperature within the limit is not required in MODE 5 or 6.

ACTIONS

A.1

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

B.1 and B.2

If the containment average air temperature cannot be restored to within its 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 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying that containment average air temperature is within the LCO limit ensures that containment operation remains within the limit assumed for the containment analyses. In order to determine the containment average air temperature, an arithmetic average is calculated, using the inlet temperature to the operating containment air coolers (i.e., 1-1, 1-2, and 1-3). ~~The 24 hour Frequency of this SR is considered acceptable based on observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment temperature condition.~~ Insert 3

BASES

ACTIONS (continued)

F.1 and F.2

If the Required Actions and associated Completion Times of Condition C, D, or E 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 6 hours and to MODE 5 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.

G.1

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

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1

Verifying the correct alignment for manual, power operated, and automatic valves in the containment spray flow path provides assurance that the proper flow paths will exist for Containment Spray System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position. Insert 3

SR 3.6.6.2

Initiating from the control room (if not already operating) and operating each required containment air cooling train for ≥ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. ~~The 31 day Frequency was developed considering the known reliability of the fan units and controls, the two train redundancy available, and the low probability of a significant degradation of the containment cooling trains occurring between surveillances and has been shown to be acceptable through operating experience.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.3

Verifying that each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by the ASME Code (Ref. 6). Since the Containment Spray System pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the INSERVICE TESTING PROGRAM.

SR 3.6.6.4

This SR requires verification that each required containment air cooling train actuates on slow speed upon receipt of an actual or simulated SFAS actuation signal. ~~The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience.~~ Insert 3

SR 3.6.6.5

Verifying that each required containment air cooling train provides a service water cooling flow rate of ≥ 1150 gpm to each cooling unit provides assurance that the flow rate assumed in the safety analyses will be achieved (Ref. 3). ~~The 24 month Frequency is based on the need to perform this Surveillance during a plant outage.~~ Insert 3

SR 3.6.6.6 and SR 3.6.6.7

These SRs require verification that each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated SFAS actuation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 24 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.6 and SR 3.6.6.7 (continued)

~~at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ Insert 4

SR 3.6.6.8

Surveillance Requirement SR 3.6.6.8 requires verification that each nozzle is unobstructed following maintenance that could cause nozzle blockage. Normal plant operation and maintenance activities are not expected to trigger performance of this surveillance requirement. However, activities such as an inadvertent spray actuation that causes fluid flow through the nozzles, or a loss of foreign material control when working within the respective system boundary may require surveillance performance. An evaluation, based on the specific situation, will determine the appropriate method (low pressure air or smoke flow test) to verify no nozzle obstruction.

REFERENCES

1. UFSAR, Appendices 3D.1.34, Criterion 38 – Containment Heat Removal; 3D.1.35, Criterion 39 – Inspection of Containment Heat Removal System; 3D.1.36, Criterion 40 – Testing of Containment Heat Removal System; 3D.1.37, Criterion 41 – Containment Atmosphere Cleanup; 3D.1.38, Criterion 42 – Inspection of Containment Atmosphere Cleanup Systems, and 3D.1.39, Criterion 43 – Testing of Containment Atmosphere Cleanup Systems.

2. UFSAR, Section 6.2.2.

3. UFSAR, Section 6.2.

4. UFSAR, Figure 6.2-26.

5. BAW-2295-A, Revision 1, Justification for Extension of Allowed Outage Time for Low Pressure Injection and Reactor Building Spray Systems.

6. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

ACTIONS

B.1 and B.2 (continued)

systems. The extended interval to reach MODE 5 allows additional time for restoration of the TSP storage baskets and is reasonable when considering that the driving force for a release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1

To reduce the potential for post-LOCA iodine re-evolution from the water in the containment emergency sump, the containment spray must be an alkaline solution. Since the BWST contents are normally acidic, the TSP storage baskets must provide sufficient volume of TSP to adjust the pH for all water injected. The minimum required volume of TSP is the volume that will achieve a post-LOCA borated water mixture pH of ≥ 7.0, conservatively considering the maximum possible sump water volume and the maximum possible boron concentration. The amount of TSP required is based on the mass of TSP needed to achieve the required pH. However, a required volume is verified by the SR, rather than the mass, since it is not feasible to weigh the entire amount of TSP in containment. The minimum required volume is based on the manufactured density of TSP (53 lb/ft^3). Since TSP can have a tendency to agglomerate from high humidity in the containment, the density may increase and the volume decrease during normal plant operation, however, solubility characteristics are not expected to change. Therefore, considering possible agglomeration and increase in density, verifying the minimum volume of TSP in the storage baskets is conservative with respect to ensuring the capability to achieve the minimum required pH. This SR is performed to verify the availability of sufficient TSP in the TSP storage baskets. A volume of ≥ 290 ft^3 of TSP will produce a pH range between 7.0 and 8.0 within 4 hours and therefore, will create the desired pH level of the containment spray. ~~The 24 month Frequency is based on the low probability of undetected change in the TSP volume occurring during the SR interval (the TSP is contained in storage baskets located in the containment normal sump and on the 565 ft elevation of containment).~~

Insert 3

REFERENCES

1. UFSAR, Section 9.3.3.2.

BASES

ACTIONS

C.1 and C.2 (continued)

The 8 hour Completion Time is consistent with that allowed in Condition A.

Inoperable MSIVs that are closed must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure these valves are in the closed position.

D.1 and D.2

If the MSIV cannot be restored to OPERABLE status or closed in the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that the closure time of each MSIV is within the limit given in Reference 5 and is within that assumed in the accident analyses. This SR also verifies the valve closure time is in accordance with the INSERVICE TESTING PROGRAM. This SR is normally performed upon returning the unit to operation following a refueling outage, because the MSIVs should not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the unit generating power. As the MSIVs are not to be tested at power, they are exempt from the ASME Code (Ref. 6) requirements during operation in MODES 1 and 2.

The Frequency for this SR is in accordance with the INSERVICE TESTING PROGRAM.

SR 3.7.2.2

This SR verifies that each MSIV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage. ~~The Frequency of MSIV testing is every 24 months. The 24 month Frequency for testing is~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.2.2 (continued)

~~based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.~~

Insert 3

REFERENCES

1. UFSAR, Section 10.3.
2. UFSAR, Section 6.2.
3. UFSAR, Section 15.4.
4. 10 CFR 100.11.
5. Technical Requirements Manual.
6. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

ACTIONS (continued)

E.1 and E.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 and SR 3.7.3.2

These SRs verify that the closure time of each MFSV, MFCV, and associated SFCV is within the limit given in Reference 1 and is within the isolation time assumed in the accident analyses. SR 3.7.3.1 also verifies the valve closure time is in accordance with the INSERVICE TESTING PROGRAM. These SRs are normally performed upon returning the unit to operation following a refueling outage. The MFSVs, MFCVs, and associated SFCV should not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the unit generating power. This is consistent with the ASME Code (Ref. 2) requirements during operation in MODES 1 and 2.

The Frequency for SR 3.7.3.1 is in accordance with the INSERVICE TESTING PROGRAM ~~and for SR 3.7.3.2 is 24 months~~.

The Frequency for SR 3.7.3.2 is controlled under the Surveillance Frequency Control Program.

SR 3.7.3.3

This SR verifies that each MFSV, MFCV, and associated SFCV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage.

~~The Frequency for this SR is every 24 months. The 24 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.~~

Insert 3

REFERENCES

1. Technical Requirements Manual.

2. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

APPLICABILITY (continued)

In MODES 5 and 6, the steam generators do not contain much energy because their temperature is below the boiling point of water; therefore, the TSVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

ACTIONS

The ACTIONS Table is modified by a NOTE indicating that separate Condition entry is allowed for each TSV.

A.1 and A.2

With one TSV inoperable, action must be taken to close the inoperable TSV within 8 hours. The 8 hour Completion Time is reasonable, considering the probability of an accident that would require actuation of the TSVs occurring during this time interval. The MSIVs are also available to provide the required isolation for the postulated accidents.

Inoperable TSVs that are closed must be verified on a periodic basis that they are closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of TSV status indications available in the control room, and other administrative controls, to ensure that these valves are closed.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

This SR verifies that the closure time of each TSV is within the limits in Reference 4 and is within that assumed in the accident and containment analyses. This SR is normally performed upon returning the unit to operation following a refueling outage, because the TSVs should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1 (continued)

~~The Frequency of TSV testing is every 24 months. The 24 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.~~

Insert 3

SR 3.7.4.2

This SR verifies that each TSV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage.

~~The Frequency of TSV testing is every 24 months. The 24 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.~~

Insert 3

REFERENCES

1. UFSAR, Section 10.2.
2. UFSAR, Section 15.4.
3. 10 CFR 100.
4. Technical Requirements Manual.

BASES

ACTIONS

D.1 and D.2 (continued)

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.

In MODE 4, with two AFW trains inoperable, operation is allowed to continue because only the MDFP train is required in accordance with the Note that modifies the LCO. Although not required, the unit may continue to cool down and initiate DHR.

E.1

Required Action E.1 is modified by a Note indicating that all required MODE changes are suspended until at least one EFW train is restored to OPERABLE status.

With all EFW trains inoperable in MODE 1, 2, or 3, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety grade equipment. In such a condition, the unit should not be perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore at least one EFW train to OPERABLE status. LCO 3.0.3 is not applicable, as it could force the units into a less safe condition.

F.1

In MODE 4, either the steam generator loops or the DHR loops can be used to provide heat removal, which is addressed in LCO 3.4.6, "RCS Loops - MODE 4." With the required MDFP train inoperable, action must be immediately initiated to restore the inoperable train to OPERABLE status.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the EFW water and steam supply flow paths provides assurance that the proper flow paths exist for EFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since those valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1 (continued)

Surveillance 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.

A Note has been added that allows the MDFP train valves to be in the non-correct position (aligned in the Main Feedwater mode) when in MODE 1 ≤ 40% RTP or in MODE 2, 3, or 4, provided the valves are capable of being locally realigned to the correct position (i.e., aligned in the AFW mode). The capability of the valves to be locally realigned to the correct position is met if a handwheel is present for each manual valve and either a handwheel is present or a power supply is available for each power operated valve. This Note is necessary because the MDFP train is normally aligned to the Main Feedwater System during a reactor startup. The allowance is acceptable since the MDFP train is a manually actuated train.

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~ Insert 3

SR 3.7.5.2

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of pump performance required by the ASME Code (Ref. 3). Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this test is performed on recirculation flow.

This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing as discussed in the ASME Code (Ref. 3) and the INSERVICE TESTING PROGRAM satisfies this requirement. Insert 3

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.3

This SR verifies the ability of the MDFP train to operate in the emergency feedwater mode. This SR verifies the proper operation of each power operated and automatic valve in the MDFP train flow path to the AFW System, and that the MDFP can be started and operated from the control room.

As noted, the SR is not required to be performed until 73 hours after the MDFP train is aligned to the AFW System. This Note is necessary because the MDFP train is normally aligned to the Main Feedwater System during a reactor startup. This allowance is acceptable since any inoperabilities with the MDFP train would likely be discovered during the reactor startup when it is being used in the main feedwater mode.

~~The 92 day Frequency is acceptable based on engineering judgment and corresponds to the testing requirements for pumps as contained in the ASME Code (Ref. 3).~~ Insert 3

SR 3.7.5.4

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an SFRCS signal by demonstrating that each AFW automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 24 month Frequency is also acceptable based on operating experience and design reliability of the equipment.~~ Insert 3 This SR is modified by a Note indicating that the SR be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.

SR 3.7.5.5

This SR verifies that the AFW pumps start in the event of any accident or transient that generates an SFRCS signal by demonstrating that each AFW pump starts automatically on an actual or simulated actuation signal. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.5 (continued)

~~with the reactor at power.~~ This SR is modified by a Note indicating that the SR be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.

Insert 3

SR 3.7.5.6 and SR 3.7.5.7

This SR ensures that EFW is properly aligned by verifying the flow paths to each steam generator prior to entering MODE 2 (for SR 3.7.5.6) and MODE 3 (for SR 3.7.5.7), following refueling or after more than 30 days in any combination of MODE 5 or 6, or defueled. OPERABILITY of EFW flow paths must be demonstrated before sufficient core heat is generated that would require the operation of EFW during a subsequent shutdown. The flow paths shall be verified by either steam generator level change or AFW safety grade flow indication (e.g., the Post Accident Monitoring AFW Flow Rate indicators). Verification of actual AFW flow capacity is not required by this SR. The Frequency is reasonable, based on engineering judgment, in view of other administrative controls to ensure that the flow paths are OPERABLE. To further ensure EFW alignment, flow path OPERABILITY is verified, following extended outages to determine no misalignment of valves has occurred. This SR ensures that the common flow path from the CSTs to the steam generator is properly aligned.

SR 3.7.5.8, SR 3.7.5.9, and SR 3.7.5.10

These SRs are performed on each AFW train's Steam Generator Level Control System channels. This helps ensure the each AFW train properly controls steam generator level after an automatic start of the AFW train.

Performance of the CHANNEL CHECK ~~every 12 hours~~ ensures a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.8, SR 3.7.5.9, and SR 3.7.5.10 (continued)

criteria, it may be an indication that the detector or the signal processing equipment has drifted outside its limit. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction.

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

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the unit specific setpoint and tolerance.

~~The CHANNEL CHECK Frequency of every 12 hours is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

~~The CHANNEL FUNCTIONAL TEST Frequency of 31 days is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK), that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.~~

~~The CHANNEL CALIBRATION Frequency of 24 months is based on the need to perform this Surveillance under the conditions that apply during a plant outage.~~

Insert 4

REFERENCES

1. UFSAR, Section 9.2.7.
2. UFSAR, Section 9.2.8.
3. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

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

Insert 3

REFERENCES

1. UFSAR, Section 9.2.6.

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," and LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable CCW loop results in an inoperable EDG or DHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

If one CCW loop is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE CCW loop is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE loop, and the low probability of a DBA occurring during this period.

B.1 and B.2

If the CCW loop cannot be restored to OPERABLE status in the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

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

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This SR is modified by a Note indicating that the isolation of the CCW flow to individual components may render those components inoperable, but does not affect the OPERABILITY of the CCW System.

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

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.2

This SR verifies proper automatic operation of the CCW valves on an actual or simulated actuation (i.e., SFAS) signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated actuation (i.e, SFAS) signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

REFERENCES 1. UFSAR, Section 9.2.2.

BASES

ACTIONS

A.1 (continued)

applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," should be entered if an inoperable SWS loop results in an inoperable EDG. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable SWS loop results in an inoperable DHR loop. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE loop, and the low probability of a DBA occurring during this period.

B.1 and B.2

If the SWS loop cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours.

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

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the SWS flow path provides assurance that the proper flow paths exist for SWS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR 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 also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

~~The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.~~ Insert 3

This SR is modified by a Note indicating that the isolation of the SWS components or systems may render those components inoperable but does not affect the OPERABILITY of the SWS.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.2

The SR verifies proper automatic operation of the SWS valves on an actual or simulated actuation (i.e., SFAS) signal. The SWS is a normally operating system that cannot be fully actuated as part of the normal testing. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

SR 3.7.8.3

The SR verifies proper automatic operation of the SWS pumps on an actual or simulated (i.e., SFAS) actuation signal. The SWS is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. ~~The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at a 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

REFERENCES

1. UFSAR, Section 9.2.1.
2. UFSAR, Section 6.2.
3. UFSAR, Section 6.3.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 days) cooling can be maintained. The level specified also ensures NPSH is available for operating the SWS pumps. ~~The 24 hour Frequency is based on operating experience related to the trending of the parameter variations during the applicable MODES.~~ This SR verifies that the UHS water level is ≥ 562 ft International Great Lakes Datum.

Insert 3

SR 3.7.9.2

This SR verifies that the SWS can cool the CCW System to at least its maximum design temperature within the maximum accident or normal heat loads for 30 days following a Design Basis Accident. ~~The 24 hour Frequency is based on operating experience related to the trending of the parameter variations during the applicable MODES.~~ This SR verifies that the UHS average water temperature is ≤ 90°F.

Insert 3

REFERENCES

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

BASES

ACTIONS (continued)

C.1 and C.2

In MODE 1, 2, 3, or 4, if any Required Action and associated Completion Time of Condition A or B cannot be met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

During movement of irradiated fuel assemblies, if the CRE boundary is inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

E.1

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

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once every month adequately checks this system. Initiating each train from the control room, with flow through the HEPA filters and charcoal adsorbers, and operating for ≥ 15 minutes demonstrates the function of each train. ~~The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.~~ Insert 3

SR 3.7.10.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.2 (continued)

efficiency, system flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.3

This SR verifies that the Control Room Normal Ventilation System isolates on an actual or simulated actuation (i.e., SFAS and Station Vent Normal Range Radiation Monitoring) signal. ~~The Frequency of 24 months is based on operating experience and is consistent with the typical refueling cycle.~~ Insert 3

SR 3.7.10.4

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 whole body or its equivalent to any part of the body 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.

SR 3.7.10.5

This SR verifies the CREVS can supply the CRE with outside air to meet the design requirement. ~~The Frequency of 24 months is consistent with industry practice and other filtration SRs.~~ Insert 3

REFERENCES

1. UFSAR, Section 9.4.1.

2. UFSAR, Section 15.4.6.

3. UFSAR, Section 6.4.

BASES

LCO

Two independent and redundant trains of the CREATCS are required to be OPERABLE to ensure that at least one is available, assuming a single failure disables the other train. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

A CREATCS train is considered OPERABLE when the individual components that are necessary to maintain control room temperature are OPERABLE. These components include the cooling coils, water and air cooled condensing units, and associated temperature control instrumentation. In addition, each CREATCS train must be OPERABLE to the extent that air circulation can be maintained.

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREATCS must be OPERABLE to ensure that the control room temperature will not exceed equipment OPERABILITY requirements following isolation of the control room.

ACTIONS

A.1

With one CREATCS train inoperable, action must be taken to restore the inoperable CREATCS train to OPERABLE status within 30 days. In this condition, the remaining OPERABLE CREATCS train is adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a failure in the OPERABLE CREATCS train could result in a loss of CREATCS function. The 30 day Completion Time is based on the low probability of an event occurring requiring control room isolation, the consideration that the remaining train can provide the required capabilities, and the alternate nonsafety related cooling means that are available.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of the system is sufficient to remove the heat load assumed in the safety analyses. This SR consists of verifying the heat removal capability of the condenser heat exchangers (either through performance testing or inspection), ensuring the proper operation of major components in the refrigeration cycle, and

BASES

SR 3.7.11.1 (continued)

verification of component flow capacities. ~~A 24-month Frequency is appropriate, as significant degradation of the CREATCS is slow and is not expected over this time period.~~ Insert 3

REFERENCES 1. UFSAR, Section 9.4.1.

BASES

ACTIONS (continued)

C.1 and C.2

If the Station EVS train or the shield building area negative pressure boundary cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Initiating each train from the control room, with flow through the HEPA filters and charcoal adsorbers, and operating for ≥ 15 minutes demonstrates the function of each train. ~~The 31 day Frequency is based on known reliability of equipment and the two train redundancy available.~~ Insert 3

SR 3.7.12.2

This SR verifies that the required Station EVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, 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.

SR 3.7.12.3

This SR verifies that each Station EVS train starts and operates on an actual or simulated actuation (i.e., containment isolation) signal. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.4

This SR verifies the integrity of the shield building area negative pressure boundary. The ability of the Station EVS to attain a negative pressure in the annulus is periodically tested to verify proper functioning of the Station EVS. During the post accident mode of operation, the Station EVS is designed to maintain a slight negative pressure in the shield building area negative pressure boundary with respect to adjacent areas to prevent unfiltered leakage. The Station EVS is designed to attain this negative pressure at a flow rate of ≥ 7200 cfm and ≤ 8800 cfm from the shield building area negative pressure boundary. The Surveillance is performed with the flow path established prior to starting the Station EVS fan, and the other dampers associated with the Shield Building area negative pressure boundary closed. The 4 seconds required to attain a negative pressure of ≥ 0.25 inches water gauge is based on: an assumed leakage area of 2.4 square feet; and a starting pressure of zero at the required flowrate. ~~The Frequency of 24 months on a STAGGERED TEST BASIS is consistent with industry practice.~~ Insert 3

SR 3.7.12.5

Operating each Station EVS filter cooling bypass damper (i.e., EVS fans cross tie dampers, CV5056 and CV5057) is necessary to ensure that the system functions properly. The OPERABILITY of the Station EVS filter cooling bypass damper is verified if it can be opened. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

REFERENCES

1. UFSAR, Section 6.2.3.
2. UFSAR, Section 9.4.2.2.
3. UFSAR, Section 15.4.6.
4. 10 CFR 100.11.
5. Technical Requirements Manual.

BASES

ACTIONS

B.1 and B.2 (continued)

fuel movement suspended. This action ensures that the remaining train is OPERABLE, that no undetected failures preventing system operation will occur, and that any active failures will be readily detected.

If the system is not placed in operation, this action requires suspension of irradiated fuel movement in the spent fuel pool building, which precludes a fuel handling accident. This action does not preclude the movement of fuel assemblies to a safe position.

C.1

When two trains of the Spent Fuel Pool Area EVS are inoperable, the unit must be placed in a condition in which the LCO does not apply. This LCO involves immediately suspending movement of irradiated fuel assemblies in the spent fuel pool building. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system. Initiating each train from the control room, with flow through the HEPA filters and charcoal adsorbers, and operating for ≥ 15 minutes demonstrates the function of each train. ~~The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.~~ Insert 3

SR 3.7.13.2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.3

This SR verifies that each Spent Fuel Pool Area EVS train actuates on an actual or simulated actuation (i.e., Fuel Handling Exhaust - High Radiation) signal. This test includes ensuring the FHAVS supply and exhaust fans trip and their respective inlet and outlet dampers close, the Fuel Handling Area to Emergency Ventilation dampers open, and the Station EVS fans start. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

Insert 3

SR 3.7.13.4

This SR verifies the integrity of the spent fuel pool area negative pressure boundary. The ability of the spent fuel pool area negative pressure boundary (which includes the containment if the containment equipment hatch is open) to maintain a negative pressure, with respect to outside atmosphere, is periodically tested to verify proper function of the Spent Fuel Pool Area EVS. During the post accident mode of operation, the Spent Fuel Pool Area EVS is designed to maintain a slight negative pressure in the spent fuel pool area negative pressure boundary to prevent unfiltered leakage. ~~The Frequency of 24 months on a STAGGERED TEST BASIS is consistent with industry practice.~~

Insert 3

SR 3.7.13.5

Operating each Spent Fuel Pool Area EVS filter cooling bypass damper (i.e., EVS fans cross tie dampers, CV5056 and CV5057) is necessary to ensure that the system functions properly. The OPERABILITY of the Spent Fuel Pool Area EVS filter cooling bypass damper is verified if it can be opened. ~~Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

Insert 3

REFERENCES

1. UFSAR, Section 6.2.3.

2. UFSAR, Section 15.4.7.

3. Regulatory Guide 1.25.

4. 10 CFR 100.11.

BASES

ACTIONS

A.1

When the initial conditions for an accident cannot be met, immediate action must be taken to preclude the occurrence of an accident. With the spent fuel pool at less than the required level, the movement of irradiated fuel assemblies in the spent fuel pool is immediately suspended. This effectively precludes the occurrence of a fuel handling accident. In such a case, unit procedures control the movement of loads over the spent fuel. This does not preclude movement of a fuel assembly to a safe position.

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1

This SR verifies that sufficient spent fuel pool water is available in the event of a fuel handling accident. The water level in the spent fuel pool must be checked periodically. ~~The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by unit procedures and are acceptable, based on operating experience.~~ Insert 3

During refueling operations, the level in the spent fuel pool is at equilibrium with that in the refueling canal, and the level in the refueling canal is checked ~~daily~~ in accordance with SR 3.9.6.1.

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.4.7.
4. Regulatory Guide 1.25.
5. 10 CFR 100.11.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies that the concentration of boron in the spent fuel pool is within the required limit. As long as this SR is met, the analyzed incidents are fully addressed. ~~The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place over a short period of time.~~

Insert 3

REFERENCES

1. UFSAR, Section 9.1.2.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.17.1

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

Insert 3

REFERENCES

1. 10 CFR 100.
2. UFSAR, Section 15.4.

BASES

ACTIONS (continued)

B.1 (continued)

accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.18.1

This SR verifies the steam generator level to be within acceptable limits. ~~The 12 hour Frequency is adequate because the operator will be aware of unit evolutions that can affect the steam generator level between checks. 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 steam generator level status.~~

Insert 3

REFERENCES

1. UFSAR, Section 15.4.4.

2. NRC Safety Evaluation for Technical Specification Amendment 192, NRC Letter, Log No. 4424, dated October 7, 1994.

BASES

SURVEILLANCE REQUIREMENTS (continued)

recommendations of Regulatory Guide 1.9 (Ref. 3) and Regulatory Guide 1.137 (Ref. 10).

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum starting output voltage of 4070 V is based on the minimum voltage value required to close the EDG output circuit breaker. The minimum steady state output voltage of 4088 V is the minimum EDG voltage setpoint value evaluated in the EDG transient analysis, which demonstrates Safety Guide 9 (Ref. 11) transient voltage criteria are satisfied. The maximum steady state output voltage of 4400 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 voltage. The minimum starting frequency value was chosen to be consistent with the minimum steady state frequency requirements. The minimum steady state output frequency of 59.5 Hz is the minimum EDG frequency value evaluated for plant-specific accident analyses, and is demonstrated by the EDG transient analysis to satisfy Safety Guide 9 (Ref. 11) transient frequency criteria. The maximum steady state output frequency of 60.5 Hz supports plant-specific analyses values.

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 3

SR 3.8.1.2 and SR 3.8.1.8

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

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 1 for SR 3.8.1.2 and the Note for SR 3.8.1.8) to indicate that all EDG starts for

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2 and SR 3.8.1.8 (continued)

these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

For the purposes of SR 3.8.1.2 and SR 3.8.1.8 testing, the EDGs are started from standby conditions. Standby conditions for an EDG means that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, some manufacturers recommend a modified start in which the starting speed of EDGs is limited, warmup is limited to this lower speed, and the EDGs are gradually accelerated to synchronous speed prior to loading. This is the intent of Note 2, which is only applicable when such modified start procedures are recommended by the manufacturer.

SR 3.8.1.8 requires that~~, at a 184 day Frequency,~~ the EDG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the UFSAR, Section 15 (Ref. 5).

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 2) when a modified start procedure as described above is used. If a modified start is not used, the 10 second start requirement of SR 3.8.1.8 applies.

Since SR 3.8.1.8 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2.

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 monitored to identify degradation of governor and voltage regulator performance.

~~The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.8 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.~~

Insert 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.3

Consistent with Regulatory Guide 1.9 (Ref. 3), this Surveillance verifies that the EDGs are capable of synchronizing with the offsite electrical system and accepting loads 90% to 100% of the continuous rating of the EDG. A run time of 60 minutes ensures the engine temperatures are stabilized, 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 lagging power factor between 0.8 and 0.95. The 0.8 value is the design rating of the machine, while the 0.95 is an administrative limitation. The load band is provided to avoid routine overloading of the EDG. Routine overloading may result in more frequent teardown inspections being required in order to maintain EDG reliability.

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

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this 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. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful EDG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is within the required limit. The level is expressed as an equivalent volume in gallons, and ensures adequate fuel oil for approximately 20 hours of EDG operation at full load. This volume is also credited (in conjunction with the minimum required level in the associated storage tank) to support 7 days of EDG operation at full load.

~~The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from each fuel oil day tank ~~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 Frequency is consistent with Regulatory Guide 1.137 (Ref. 10).~~ 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 the performance of this Surveillance.

Insert 3

SR 3.8.1.6

Under accident coincident with loss of offsite power conditions loads are sequentially connected to the bus by the load sequencers and emergency time delay relays (i.e., the makeup pump relays). 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 essential buses.

~~The Frequency of 31 days is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance. Operating experience has shown that these components usually pass the SR when performed at the 31 day Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

Insert 3

SR 3.8.1.7

This Surveillance demonstrates that each fuel oil transfer pump (one per fuel oil transfer system) operates and transfers fuel oil from its associated storage tank to its associated day tank. This is required to support

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.7 (continued)

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 fuel transfer systems are OPERABLE.

~~The Frequency for this SR is 92 days. The 92 day Frequency corresponds to the testing requirements for pumps as contained in the ASME OM Code (Ref. 12).~~ Insert 3

SR 3.8.1.9

Transfer of each 4.16 kV essential bus power supply from the unit auxiliary source (i.e., the main generator) to the pre-selected offsite circuit (i.e., pre-selected startup tarnsformer) demonstrates that if the unit auxiliary source is supplying power, the transfer circuitry to the qualified offsite circuits is OPERABLE. This ensures the capability of the offsite circuits to be properly aligned, since the unit auxiliary source is not a qualified offsite circuit. As noted (Note 1), the transfer capability is only required to be met if the unit auxiliary source is supplying the electrical power distribution subsystem. Transfer of each 4.16 kV essential bus power supply from the normal offsite circuit to the alternate offsite circuit (via the fast transfer between the two startup transformers) demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads.

~~The 24 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ Insert 3

This SR is modified by a Note (Note 2). The reason for the Note is that during operation with the reactor critical, performance of the automatic transfer portion of SR 3.8.1.9.a and all of SR 3.9.1.9.b could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the automatic portion of SR 3.8.1.9.a and all of SR 3.8.1.9.b in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.9 (continued)

OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.10

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 (the high pressure injection pumps - approximately 540 kW) without exceeding a predetermined margin to the overspeed trip. This Surveillance may be accomplished by either:

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 or its equivalent with the EDG solely supplying the bus.

Consistent with Safety Guide 9 (Ref. 11), 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 corresponds to 66.75 Hz, which is 75% of the difference between synchronous speed and the overspeed trip setpoint.

~~The 24 month Frequency takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.10 (continued)

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the EDG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed within the power factor limit. This power factor is representative of the actual inductive loading an EDG would see under design basis accident conditions. The power factor limit is ≤ 0.84 for EDG 1 and ≤ 0.84 for EDG 2. Under certain conditions, however, Note 2 allows the Surveillance to be conducted outside the power factor limit. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to within the limit results in voltages on the essential buses that are too high. Under these conditions, the power factor should be maintained as close as practicable to the limit while still maintaining acceptable voltage limits on the essential buses. In other circumstances, the grid voltage may be such that the EDG excitation levels needed to obtain a power factor within limit may not cause unacceptable voltages on the essential buses, but the excitation levels are in excess of those recommended for the EDG. In such cases, the power factor shall be maintained as close as practicable to the power factor limit without exceeding the EDG excitation limits.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.11

Consistent with Regulatory Guide 1.9 (Ref. 3), paragraph C.2.2.4, this Surveillance demonstrates the operability 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 non-essential loads and energization of the essential buses and respective loads from the EDG. 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 to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability 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 (i.e., the individual time delay relays for the component cooling water, service water, and makeup pumps). In certain circumstances, some of these loads can not actually be connected or loaded without undue hardship or potential for undesired operation. 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.

~~The Frequency of 24 months takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~ Insert 3

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the EDGs during testing. For the purpose of this testing, the EDGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.11 (continued)

other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1, 2, 3, or 4.

Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.12

This Surveillance demonstrates that EDG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal or an SFAS actuation test signal. Noncritical automatic trips are all automatic trips except:

a. Engine overspeed; and

b. Generator differential current.

The noncritical trips are bypassed during DBAs and provide alarms on abnormal engine conditions. These alarms provide 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.

~~The 24 month Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert 3

The SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required EDG from service. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.12 (continued)

surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.13

Consistent with IEEE 387-1995 (Ref. 13), this Surveillance demonstrates the EDGs can start and run continuously at full load capability (90% to 100% of the EDG continuous rating) for an interval of not less than 8 hours, ≥ 2 continuous hours of which is at a load equivalent to 105% to 110% of the continuous rating and the remainder of the time at a load equivalent to 90% to 100% of the continuous rating of the EDG. The EDG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

The 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.

~~The 24 month Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13 (continued)

cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Note 3 ensures that the EDG is tested under load conditions that are consistent with Regulatory Guide 1.9 (Ref. 3) for the 2-hour portion of the test and are as close to design conditions as possible for the 6-hour portion of the test. When synchronized with offsite power, testing should be performed within the power factor limit. This power factor is representative of the actual inductive loading an EDG would see under design basis accident conditions. When an EDG is tested at a load equivalent to 105% to 110% of the continuous rating (part a), the power factor limit is $\leq$ 0.90. When an EDG is tested at a load equivalent to 90% to 100% of the continuous rating (part b), the power factor limit is ≤ 0.84 for EDG 1 and ≤ 0.84 for EDG 2. Under certain conditions, however, Note 3 allows the Surveillance to be conducted outside the power factor limit. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to within the limit results in voltages on the essential buses that are too high. Under these conditions, the power factor should be maintained as close as practicable to the limit while still maintaining acceptable voltage limits on the essential buses. In other circumstances, the grid voltage may be such that the EDG excitation levels needed to obtain a power factor within limit may not cause unacceptable voltages on the essential buses, but the excitation levels are in excess of those recommended for the EDG. In such cases, the power factor shall be maintained as close as practicable to the power factor limit without exceeding the EDG excitation limits.

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 required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA.

~~The 24 month Frequency is based on engineering judgment 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 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~ Insert 3

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the EDG. Routine overloads may result in more frequent teardown inspections, in accordance with vendor recommendations, in order to maintain EDG OPERABILITY. The requirement that the diesel has operated for at least 1 hour at approximately full load conditions prior to performance of this Surveillance is based on achieving hot, stabilized conditions. 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

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 the EDG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an SFAS actuation signal. For this test, the EDG loading logic includes both the load sequencer and the individual time delay relays for the makeup pumps. 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.

~~The Frequency of 24 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 24 months.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.15 (continued)

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the EDGs during testing. For the purpose of this testing, the EDGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for EDGs. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

BASES

ACTIONS (continued)

D.1

If the test results for the new fuel oil properties defined in the Bases for SR 3.8.3.3 that are not required to be obtained prior to addition of the new fuel oil to the storage tanks are not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if an EDG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the EDG would still be capable of performing its intended function.

E.1

With starting air receiver pressure < 210 psig in the required air start receiver, sufficient capacity for five successive EDG start attempts does not exist. However, as long as the receiver pressure is ≥ 139 psig, there is adequate capacity for at least one start attempt, and the EDG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the EDG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most EDG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

F.1

With a Required Action and associated Completion Time not met, or one or more EDGs with fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through E, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days at full load. Credit for the minimum required level in the associated day tank (4000 gallons per SR 3.8.1.4) is being taken to support the 7 days of EDG operation. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1 (continued)

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

Insert 3

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each EDG. The 260 gal requirement is based on the EDG manufacturer consumption values for the run time of the EDG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the EDG, when the EDG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

~~A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since EDG starts and run time are closely monitored by the unit staff.~~

Insert 3

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for 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 receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

a. Sample the new fuel oil in accordance with ASTM D4057-95 (Ref. 6);

b. Verify in accordance with the tests specified in ASTM D975-06 (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.825 and ≤ 0.876 or an API gravity at 60°F of ≥ 30° and ≤ 40° when tested in accordance with ASTM D1298-85 (Ref. 6), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point of ≥ 125°F; and

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.3 (continued)

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 the test specified in ASTM D975-06 (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 concern since the fuel oil is not added to the storage tanks.

Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-06 (Ref. 7) are met for new fuel oil when tested in accordance with ASTM D975-06 (Ref. 6), except that the analysis for sulfur may be performed in accordance with ASTM D4294-90 (Ref. 6). The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on EDG operation. This Surveillance ensures the availability of high quality fuel oil for the EDGs.

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

Particulate concentrations should be determined in accordance with ASTM D2276-88 (Ref. 6). The total particulate concentration in the fuel oil has a limit of 10 mg/l.

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

SR 3.8.3.4

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each EDG is available. The system design requirements for each air start receiver provide for a minimum of five engine start cycles without recharging. The pressure specified in this SR is intended to reflect the lowest value at which the five starts can be accomplished using only one of the two air start receivers for each EDG.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.4 (continued)

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

Insert 3

SR 3.8.3.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel 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 3

REFERENCES

1. UFSAR, Section 8.3.1.
2. Regulatory Guide 1.137.
3. ANSI N195-1976, Appendix B.
4. UFSAR, Section 6.
5. UFSAR, Section 15.
6. ASTM Standards: D4057-95; D975-06; D1298-85; D4176-86; D4294-90; D2276-88.
7. ASTM Standards, D975-06, Table 1.

BASES

ACTIONS

B.1 (continued)

of the inoperable DC electrical power source and, if the DC electrical power source is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

C.1 and C.2

If the inoperable DC electrical power source cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC source. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer (130.2 V at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). ~~The 7 day Frequency is consistent with manufacturer recommendations and IEEE 450 (Ref. 8).~~

Insert 3

SR 3.8.4.2

This SR verifies the required design capacity of the required battery chargers. According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.2 (continued

charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensure that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying 475 amps at the minimum established float voltage for 8 hours. The ampere requirements are also well within the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least 8 hours.

The other option requires that each required battery charger be capable of recharging the battery after a service test coincident with supplying the largest combined demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ 2 amps.

~~The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals.~~

Insert 3

SR 3.8.4.3

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

~~The Surveillance Frequency of 24 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 24 months.~~

Insert 3

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.3 (continued)

The reason for Note 2 is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE-308-1971.
4. UFSAR, Section 8.
5. UFSAR, Section 6.
6. UFSAR, Section 15.
7. Regulatory Guide 1.93, December 1974.
8. ~~IEEE-450-1995.~~ Deleted.
9. Regulatory Guide 1.32, August 1972.
10. Regulatory Guide 1.129, December 1974.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 1). ~~The 7 day Frequency is more conservative than the recommendations of IEEE-450 (Ref. 1).~~ Insert 3

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained the Required Actions of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of 2 amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained.

SR 3.8.6.2 and SR 3.8.6.5

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 130.2 V at the battery terminals, or 2.17 Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than 2.07 Vpc, are addressed in Specification 5.5.16. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are greater than the short term absolute minimum voltage of 2.07 V. ~~The Frequencies for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell are consistent with IEEE-450 (Ref. 1).~~ Insert 4

SR 3.8.6.3

The minimum established design limit specified for electrolyte level (greater than the minimum level indication mark) ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. ~~The Frequency is consistent with IEEE-450 (Ref. 1).~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.4

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

Insert 3

SR 3.8.6.6

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

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

A modified discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test as specified in IEEE-450 (Ref. 1).

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

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 1) and IEEE-485 (Ref. 4). These references recommend that the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.6 (continued)

battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

Insert 3

~~The Surveillance Frequency for this test is normally 60 months.~~ If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's ratings. Degradation is indicated, according to IEEE-450 (Ref. 1), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is below 90% of the manufacturer's rating. These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1).

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

REFERENCES

1. IEEE-450-1995.

2. UFSAR, Section 6.

3. UFSAR, Section 15.

4. IEEE-485-1983, June 1983.

BASES

ACTIONS

A.1 (continued)

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the 120 VAC vital bus is powered from its Class 1E constant voltage transformer, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the 120 VAC vital buses is the preferred source for powering instrumentation trip setpoint devices.

B.1

With two inverters in the same train inoperable, the remaining inverters are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in one of the two remaining inverters could result in the minimum ESF functions not being supported. Therefore, one of the inverters must be restored to OPERABLE status within 8 hours.

The 8 hour Completion Time is consistent with that allowed for an inoperable train of 120 VAC vital buses.

C.1 and C.2

If the inoperable Train 1 or Train 2 inverters cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and 120 VAC vital buses energized from the associated inverter. Each inverter may be connected to its associated rectifier as long as the battery is available as the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1 (continued)

uninterruptible power supply. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and SFAS connected to the 120 VAC vital buses. ~~The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.~~

Insert 3

REFERENCES

1. UFSAR, Section 8.3.
2. UFSAR, Section 6.
3. UFSAR, Section 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the required inverter is functioning properly with all required circuit breakers closed and 120 VAC vital bus energized from the inverter. The inverter may be connected to its associated rectifier as long as the battery is available as the uninterruptible power supply. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the 120 VAC vital bus. ~~The 7 day Frequency takes into account the other indications available in the control room that alert the operator to inverter malfunctions.~~

Insert 3

REFERENCES

1. UFSAR, Section 6.
2. UFSAR, Section 15.

BASES

ACTIONS

C.1 (continued)

c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time for DC buses is consistent with Regulatory Guide 1.93 (Ref. 3).

D.1 and D.2

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

E.1

Condition E corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one inoperable electrical power distribution subsystem results in the loss of a required function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required AC, DC, and AC vital bus electrical power distribution systems are functioning properly, with the correct circuit breaker (which includes all types of circuit breaking devices) alignment. The correct breaker alignment, including tie breakers open between redundant buses, ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. ~~The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~ The voltage of the DC bus must be greater than or equal to 125 VDC. Insert 3

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the required AC, DC, and AC vital bus electrical power distribution subsystems are functioning properly, with the correct breaker (which includes all types of circuit breaking devices) alignment. The verification of proper voltage availability on the required buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these required buses. ~~The 7 day Frequency takes into account the capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~ The voltage of the required DC bus must be greater than or equal to 125 VDC.

Insert 3

REFERENCES

1. UFSAR, Section 6.

2. UFSAR, Section 15.

BASES

ACTIONS

A.1 (continued)

volume in the RCS or the refueling canal is less than its limit, all operations involving positive reactivity additions must be suspended immediately.

Suspension of positive reactivity additions shall not preclude moving a component to a safe position. Operations that individually add limited positive reactivity (e.g., temperature fluctuations from inventory addition or temperature control fluctuations), but when combined with all other operations affecting core reactivity (e.g., intentional boration) result in overall net negative reactivity addition, are not precluded by this action.

A.2

In addition to immediately suspending positive reactivity additions, action to restore the concentration must be initiated immediately.

In determining the required combination of boration flow rate and concentration, there is no unique Design Basis Event that must be satisfied. The only requirement is to restore the boron concentration to its required value as soon as possible. In order to raise the boron concentration as soon as possible, the operator should begin boration with the best source available for unit conditions.

Once action has been initiated, it must be continued until the boron concentration is restored. The restoration time depends on the amount of boron that must be injected to reach the required concentration.

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

This SR ensures the coolant boron concentration in the RCS, and connected portions of the refueling canal is within the COLR limits. The boron concentration of the coolant in each required volume is determined periodically by chemical analysis. Prior to re-connecting portions of the refueling canal to the RCS, this SR must be met per SR 3.0.4. If any dilution activity has occurred while the canal was disconnected from the RCS, this SR ensures the correct boron concentration prior to communication with the RCS.

~~The SR 3.9.1.1 Frequency of once every 72 hours is a reasonable amount of time to verify the boron concentration of representative samples. The Frequency is based on operating experience, which has shown 72 hours to be adequate.~~ Insert 3

BASES

ACTIONS

B.2 (continued)

condition is stabilized until the source range neutron flux monitors are OPERABLE. This stabilized condition is determined by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

The Completion Time of once per 12 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration and ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

SR 3.9.2.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions.

~~The Frequency of 12 hours is consistent with the CHANNEL CHECK Frequency specified similarly for the same instruments in LCO 3.3.9.~~

Insert 3

SR 3.9.2.2

SR 3.9.2.2 is the performance of a CHANNEL CALIBRATION ~~every 18 months~~. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the RPS source range channel is a complete check and re-adjustment of the channels, from the preamplifier input to the indicators, and for the PAM source range channels is a complete check of the instrument channel. ~~Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.~~

Insert 3

BASES

ACTIONS

A.4, A.5, and A.6 (continued)

gas monitor, including all automatic actuations resulting from a high radiation signal (i.e., the shutting down of the containment purge and exhaust supply and exhaust fans and closure of the associated inlet and outlet dampers), and one containment purge and exhaust isolation valve in each penetration flow path, which is capable of being manually closed from the control room.

With DHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Performing the actions stated above ensures that all containment penetrations are either closed or can be closed so that the dose limits are not exceeded.

The Completion Time of 4 hours allows fixing of most DHR problems and is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that the DHR loop is in operation and circulating reactor coolant. The flow rate (i.e., ≥ 2800 gpm) is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator in the control room for monitoring the DHR System.~~ Insert 3

REFERENCES

1. UFSAR, Appendix 3D.1.30, Criterion 34 – Residual Heat Removal.
2. UFSAR, Section 9.3.5.

BASES

ACTIONS

B.3, B.4, and B.5 (continued)

verified to be capable of being closed by a Containment Purge and Exhaust Isolation System. A Containment Purge and Exhaust Isolation System consists of a containment purge and exhaust noble gas monitor, including all automatic actuations resulting from a high radiation signal (i.e., the shutting down of the containment purge and exhaust supply and exhaust fans and closure of the associated inlet and outlet dampers), and one containment purge and exhaust isolation valve in each penetration flow path, which is capable of being manually closed from the control room.

With DHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Performing the actions stated above ensures that all containment penetrations are either closed or can be closed so that the dose limits are not exceeded.

The Completion Time of 4 hours allows fixing of most DHR problems and is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that one DHR loop is in operation. The flow rate (i.e., ≥ 2800 gpm) is determined by the flow rate necessary to provide efficient decay heat removal capability and to prevent thermal and boron stratification in the core.

In addition, during operation of the DHR loop with the water level in the vicinity of the reactor vessel nozzles, the DHR loop flow rate determination must also consider the DHR pump suction requirement. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator to monitor the DHR System in the control room.~~ Insert 3

SR 3.9.5.2

Verification that the required pump is OPERABLE ensures that an additional DHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~ Insert 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.5.2 (continued)

This SR is modified by a Note that states the SR is not required to be performed until 24 hours after a required pump is not in operation.

REFERENCES

1. UFSAR, Appendix 3D.1.30, Criterion 34 – Residual Heat Removal.
2. UFSAR, Section 9.3.5.

BASES

ACTIONS

A.1

With a water level of < 23 ft above the top of the reactor vessel flange, all operations involving movement of irradiated fuel assemblies shall be suspended immediately to ensure that a fuel handling accident cannot occur.

The suspension of fuel movement shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a postulated fuel handling accident inside containment (Ref. 2).

~~The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls of valve positions, which make significant unplanned level changes unlikely.~~

Insert 3

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.

2. UFSAR, Section 15.4.7.

3. 10 CFR 100.10.

ENCLOSURE B

DOCUMENTATION OF DAVIS-BESSE PRA TECHNICAL ADEQUACY

DOCUMENTATION OF DAVIS-BESSE PRA TECHNICAL ADEQUACY

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DOCUMENTATION OF DAVIS-BESSE PRA TECHNICAL ADEQUACY

1.0 OVERVIEW

The implementation of the Surveillance Frequency Control Program (SFCP) (also referred to as Technical Specifications Initiative 5b) at Davis-Besse Nuclear Power Station will follow the guidance provided by Nuclear Energy Institute (NEI) in NEI 04-10, Revision 1 (Reference 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 (e.g., Nuclear Regulatory Commission (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 Integrated Decision-Making Panel (IDP). If the IDP approves the STI revision, the change is documented, implemented, and made available for future audits by the NRC. If the IDP does not approve the STI revision, the STI value is left unchanged.
- Performance monitoring is conducted as recommended by the IDP. In some cases, no additional monitoring may be necessary beyond that already conducted under the Maintenance Rule. The performance monitoring helps to confirm that no failure mechanisms related to the revised test interval become important enough to alter the information provided for the justification of the interval changes.
- The IDP is responsible for periodic review of performance monitoring results. If it is determined that the time interval between successive performances of a surveillance test is a factor in the unsatisfactory performance of the surveillance, the IDP 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. Neither the current Davis-Besse PRA model nor the industry generic failure data, for which they are based upon, distinguish between the time-related failure contribution (i.e.; the standby time-related failure rate) and the cyclic demand-related failure contribution (i.e., the demand stress failure probability) for standby component failure modes (e.g., NUREG/CR-6928 assumes these failures are on a demand basis). Since this distinction is not made, FENOC, in accordance with NEI 04-10, Revision 1, will assume that all failures are time-related in calculating the risk impact of a proposed STI adjustment, to obtain the maximum test-limited risk contribution. If a further breakdown of failure probability is

required to remove conservatism from the risk impact calculation of a proposed surveillance frequency change, it shall be justified through data and/or engineering analyses. Furthermore, FENOC will abide by the cautionary sentence in NEI 04-10, Revision 1, Step 8, third paragraph, which states, "...caution should be taken in dividing the failure probability into time-related and cyclic demand-related contributions because the test-limited risk can be underestimated when only part of the failure rate is considered as being time-related while this may not be the case."

Also, the cumulative impact of all risk-informed STI revisions on all applicable PRA evaluations (i.e., internal events, external events and shutdown) is 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 test interval change.

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

1. Identify the parts of the PRA used to support the application.
   - 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 (F&Os) 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.

Item 1 satisfies the requirements of RG 1.200, Revision 1, Section 3.1 Identification of Parts of a PRA Used to Support the Application. Item 2 satisfies the requirements of RG 1.200, Revision 1, Section 3.2 Scope of Risk Contributors Addressed by the PRA Model. Item 3 satisfies one of the requirements of RG 1.200, Revision 1, Section 4.2 Licensee Submittal Documentation. Item 4 satisfies the requirements of RG 1.200, Revision 1, Section 3.3 Demonstration of Technical Adequacy of the PRA, and the remaining requirements of RG 1.200, Revision 1, Section 4.2.

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.

2.0 TECHNICAL ADEQUACY OF THE PRA MODEL

The Davis-Besse PRA model of record, PRA-DB1-AL-R06, and supporting documentation have been maintained as a living program, with updates directed every other refueling cycle (approximately every four years) to reflect the as-built, as-operated plant. The PRA-DB1-AL-R06 PRA model currently includes internal events, internal flooding, and seismic events. Level 1 and Level 2 results are provided via this model. The Fire PRA model, which is based on the internal events model, is also being developed for implementation at Davis-Besse to support risk-informed applications and will be subject to the same configuration controls described below.

Interim updates may be prepared and issued in between regularly scheduled model updates on an as needed basis. Typically, an interim revision would be used for an update that would cause a change in core damage frequency of greater than 10 percent, a change in large early release frequency of greater than 20 percent, or for changes that could significantly impact a risk-informed application. Interim models may also be released following focused peer reviews once the associated findings and suggestions have been addressed. (Note that under the FENOC PRA Program, if a portion of the model has been upgraded to satisfy the PRA Standard (Internal Flooding models at Davis-Besse, for example), that portion of the model will not be released until after a focused peer review has been conducted and any findings and suggestions have been addressed.)

The Davis-Besse model is highly detailed and includes a wide variety of initiating events, modeled systems, operator actions, and common cause events. The PRA quantification process used is based on the large linked fault tree methodology, which is a well-known and accepted methodology in the industry. The model is maintained and quantified using the EPRI Integrated Risk Technologies (IRT) suite of software programs.

FENOC employs a multi-faceted, structured approach for establishing and maintaining the technical adequacy and plant fidelity of the PRA models for all FENOC nuclear generation sites, including Davis-Besse. This approach includes both a proceduralized PRA maintenance and update process, as well as the use of self-assessments and independent peer reviews.

2.1 PRA Maintenance and Update

The latest update to the Davis-Besse PRA occurred on February 15, 2019 with the effective reference model, PRA-DB1-AL-R06, being released at that time. There have been no interim updates to the model since its release.

The FENOC risk management process ensures that the Davis-Besse PRA model is an accurate reflection of the as-built, and as-operated plant. This process is defined in the FENOC PRA Program, which consists of a governing procedure NOPM-CC-6000, “Probabilistic Risk Assessment Program,” and subordinate implementation procedures.

Procedure NOPM-CC-6000 serves as the higher tier procedure and establishes the FENOC PRA Program and provides administrative requirements for the maintenance and upgrade of the FENOC PRA models and risk-informed applications. The overall objective of the PRA Program is to provide technically adequate PRA models such that the requirements set forth in RG 1.200 are satisfied for use in risk-informed applications.

Working in conjunction with the above procedure, NOBP-CC-6001, “Probabilistic Risk Assessment Model Management” establishes the administrative and technical requirements for the maintenance and upgrade of the FENOC PRA models.

2.2 Plant Changes Not Yet Incorporated into the PRA Model

A procedurally controlled process is used to maintain configuration control of the Davis-Besse PRA model, data, and software. In addition to model control, administrative mechanisms are in place to assure that plant modifications, procedure changes relevant to the PRA, changes to calculations, and industry operating experience (OE) are appropriately screened, dispositioned, and tracked for incorporation into the PRA model if that change would impact the model. As part of this process, if any proposed changes are identified, which are perceived to significantly increase or decrease risk, they are incorporated into a working model (given their known level of detail at the time), and the results are compared to the effective model of record to identify if the proposed change should be pursued. These processes help to assure that the Davis-Besse PRA reflects the as-built, as-operated plant within the limitations of the PRA methodology, and that the significance of future expected changes or enhancements are understood and managed.

The interfacing process involves an ongoing solicitation of review of any changes that may have an impact upon the PRA model. Any changes to the PRA model or its supporting documentation are captured within a tracking database for PRA implementation tracking and future disposition. Additionally, the PRA staff provides the top risk significant operator actions to the Operations Training staff, for simulator validation to ensure that the current human reliability modeling reflects actual expected response and timing.

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

2.3 Applicability of Peer Review Findings and Observations (F&Os)

The technical acceptability of the Davis-Besse PRA models has been demonstrated by the peer review process. The purpose of the industry PRA peer review process is to provide a method for establishing the technical capability and adequacy of a PRA relative to expectations of knowledgeable practitioners, using a set of guidance that establishes a set of minimum requirements. PRA peer reviews continue to be performed as PRAs are upgraded to ensure the ability to support risk-informed applications and has proven to be a valuable process for establishing technical adequacy of nuclear power plant PRAs.

Internal Events PRA The Davis-Besse Internal Events PRA model has been peer reviewed in accordance with the guidance and NRC-endorsed standards in effect at the time of each of the reviews as follows:

- April 2008 – full scope peer review addressing all technical elements excluding large early release and internal flooding based on RG 1.200 Rev. 1 and ASME RA-Sb-2005 (Reference 3)
- October 2011 – focus scope peer review addressing technical element large early release frequency based on RG 1.200 Rev. 2 (Reference 4) and ASME/ANS-RA-Sa-2009 (Reference 5)
- July 2012 – focus scope peer review addressing technical element internal flooding based on RG 1.200 Rev. 2 and ASME/ANS-RA-Sa-2009
- October 2017 – CCF focus scope peer review for method upgrade identified during independent assessment
- October 2017 – independent assessment of F&Os and closeout review based on Appendix X of NEI 05-04 (Reference 6); any re-assessed SRs were based on RG 1.200 Rev. 2 and ASME/ANS-RA-Sa-2009

Each of the above reviews are discussed below.

The most recent full-scope peer review of the Davis-Besse Internal Events PRA model was the April 2008 gap assessment against the ASME RA-Sb-2005, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," and RG 1.200, Revision 1. Typically, a gap assessment is performed to review the differences between two versions of the PRA ASME standard. However, the purpose of the 2008 gap assessment was to assess the current status of the internal events PRA with regard to the supporting requirements (SRs), assign an indication of the significance of the gaps and F&Os identified (levels A - D), describe the scope of effort needed to close the gap and F&O to achieve capability category II of the SR, and estimate the resources necessary to accomplish closure of the gap and F&O. Thus, this gap assessment is far more encompassing than a typical peer review of the PRA model. All requirements for conducting a peer review were met.

The review team consisted of five independent reviewers qualified per NEI 05-04, "Process for Performing Follow-on PRA Peer Reviewers Using the ASME PRA Standard," January 2005, and they evaluated the current status of the PRA against the requirements in ASME RA-Sb-2005 and RG 1.200, Revision 1.

The review was a full scope Internal Events Level 1 review, excluding large early release and internal flooding, but covering initiating events, accident sequences, success criteria, system analysis, human reliability analysis, data analysis, quantification and results, and the maintenance and update technical areas of the ASME RA-Sb-2005 PRA standard. If the PRA model and documentation did not meet at least capability category II of ASME RA-Sb-2005, an F&O was identified.

Because the peer review in 2008 predated the current RG 1.200 endorsed internal events standard, a comparison was made between the ASME/ANS RA-Sb-2005 standard used for the peer review and the endorsed ASME/ANS RA-Sa-2009 standard. For the majority of the SRs, the wording was unchanged, or the intent remained the same. There were no changes to the SRs that were found to have an impact on the internal events PRA model. Therefore, the 2008 peer review and the review of the updated PRA standard combined assure the current internal

events PRA model satisfies capability category II of the current RG 1.200 endorsed internal events standard ASME/ANS RA-Sa-2009.

The 2008 gap assessment did not review the technical areas of large early release and internal flooding. These two technical areas had separate focused scope peer reviews in 2011 (LERF) and 2012 (internal flooding) against the relevant portions of the ASME/ANS-RA-Sa-2009 standard.

All F&Os originating from the internal events, large early release, and internal flooding peer reviews were addressed using FENOC's PRA program to disposition each individual F&O, thus ensuring the model satisfies the PRA standard requirements.

The October 2017 independent assessment and closeout review addressed FENOC's disposition to all F&Os from the three peer reviews discussed above. The review was conducted consistent with NEI 05-04/07-12/12-13 Appendix X, "Fact & Observation (F&O) Close-Out with Independent Assessment." Each member of the independent assessment team met the ASME standard criteria for independence from the Davis-Besse PRA and the relevant peer reviewer qualifications for the F&Os being reviewed. Each F&O documented closure was reviewed by the team to determine if the F&O had been adequately addressed and can therefore be closed out using the appropriate parts of the ASME/ANS-RA-Sa-2009 PRA standard. The relevant SRs were also re-assessed for cases where the peer review identified the SR as not meeting capability category II. The independent assessment for internal events PRA closed all F&Os and determined each associated SR to meet at least capability category II.

During the independent assessment, the F&O dispositions for two SRs (SY-B4 and DA-D5) related to common cause failure modeling were determined by the independent assessment team to be an upgrade, rather than an update. A focused scope peer review was held, and the team concluded that these two SRs were met to at least capability category II with no new findings.

Ultimately, the independent assessment and subsequent focused scope peer review for internal events PRA closed all but one of the F&Os and determined that all but one of the supporting requirements met capability category II or better. Finding SY-B11, associated with supporting requirement SY-B10 was found to remain open. SR SY-B10 requires that those systems that are required for initiation and actuation of a system be identified. Because the PRA model justifies excluding some actuation logic due to negligible contribution for the emergency diesel generator, instead of explicitly modeling this logic, this SR was concluded to meet capability category I only, shown in Table 1 below (contained in Reference 15). Since NEI 94-01 endorses using PRA models conformed to capability category I of the ASME/ANS standard, the Davis-Besse PRA model is of sufficient technical adequacy to use for this Type A test analysis. However, the F&O remains open, since it is desired that all SRs meet capability category II.

Therefore, each SR of the internal events standard other than SY-B10 has been determined to meet at least capability category II by the peer review team or the independent assessment team. SR SY-B10 meets capability category I, with an open F&O to support meeting capability category II. There are no other open F&Os remaining.

Table 1 Davis-Besse Internal Events PRA Independent Assessment F&O Closure

Independent Assessment F&O Closure Form

Assessment of F&O SY-B11 (Finding): [Open]; [Maintenance]

Original F&O (Reference 14):
Not all permissives and lockouts checked could be found, specifically UV signal preventing closure of the EDG output breaker and concurrent SFAS 2 signal and UV signal for the sequencer. No justification for not including these does not meet Category I. Not modeling results in Category 2 not being met. Recommendation to meet CCII: Ensure all permissives and lockouts are modeled.

Utility Provided Closure Basis Information (Reference 14):
As discussed in the EDG system notebook (04-13), although the EDGs receive start signals from C1 (D1) undervoltage relays and on an SFAS Level 2 actuation, these signals are not modeled. If an EDG failed to start due to a failure of the undervoltage signal, operators could still manually start the diesel, and would be directed to do so by procedures. The likelihood that both the automatic signal and operator action fail is much less than the failure rate of the diesel to start, and is therefore not modeled. The SFAS signal is not modeled because the diesels are not needed in an SFAS situation unless an undervoltage exists on their respective bus. Justification provided in the EDG System Notebook, Section 2.

Independent Review Team Assessment:
Justification for not modeling these signals is provided which meets the requirements of CC I. However, this does not meet CC II-III, which requires modeling actuation signals and does not allow justification for excluding. Also, the utility closure basis addressed the EDG actuation logic only. The F&O requires a review for other instances where actuation logic may not have been modeled. As a result, this F&O remains open since the intent of the finding is to provide a path to CC II-III.

Assessment of Upgrades or New Methods: Maintenance

Utility Assessment of Upgrades or New Methods (Reference 14):
Maintenance. Correcting modeling errors (ASME/ANS RA-Sb-2013 Non-mandatory Appendix 1-A, Example 6).

Independent Assessment of Upgrades or New Methods:
This is a maintenance change, consistent with Example 6, system analysis logic correction.

SR Assessment:

Associated SRs (Reference 14)	Previous Peer Review Assessment (Reference 20)	Independent Review Team Assessment
SY-B10	NOT MET	Met at CC I

Fire PRA The Davis-Besse fire PRA model was peer reviewed by the PWR Owners Group in June 2013. The review was performed against the requirements of ASME/ANS RA-Sa-2009, Part 4, including Clarifications and Qualifications provided in the NRC endorsement of the Standard contained in Revision 2 to RG 1.200. The peer review was performed using the process defined in NEI 07-12, Revision 1 (Reference 11).

All F&Os originating from the Fire PRA peer review were addressed using FENOC's PRA program to disposition each individual F&O, thus ensuring the model satisfies the PRA standard requirements.

The October 2017 independent assessment and closeout review addressed FENOC's disposition to all F&Os from the Fire PRA peer review. The review was conducted consistent with NEI 05-04/07-12/12-13 Appendix X, "Fact & Observation (F&O) Close-Out with Independent Assessment." Each member of the independent assessment team met the ASME standard criteria for independence from the Davis-Besse Fire PRA and the relevant peer reviewer qualifications for the F&Os being reviewed. Each F&O documented closure was reviewed by the team to determine if the F&O had been adequately addressed and can therefore be closed out using the appropriate parts of the ASME/ANS-RA-Sa-2009 PRA standard. The relevant SRs were also re-assessed for cases where the peer review identified the SR as not meeting at least capability category II. The independent assessment for fire PRA determined each associated SR to meet at least capability category II.

During the independent assessment, the F&O dispositions associated with two SRs (PRM-B14 and PRM-B15) related to new accident progressions were determined by the independent assessment team to be an upgrade, rather than an update. In addition, at the request of FENOC, three SRs (CF-A1, CF-A2, and CF-B1) related to DC hot short methodology were requested to be addressed by a focused scope review. A focused scope peer review was held, and the team concluded that these SRs were met to at least capability category II with no new findings.

There were five finding level F&Os which remain open after the independent assessment, which are identified below in Table 2. (Note that the independent assessment also identified a suggestion level F&O to improve the PRA documentation.) The NRC staff has reviewed and accepted the disposition of these open F&Os within the Safety Evaluation (SE) Report for license amendment 298, June 21, 2019, Section 3.4.3 which concludes that the fire PRA is of sufficient technical quality (Reference 13).

F&O ES-A1-01, ES-A1-02, ES-A1-03, and FQ-A1-01 in Table 2 (contained in Reference 14) have been resolved by making appropriate changes to the PRA model as identified in the F&O. The associated SRs ES-A1 and FQ-A1 continue to be met, as identified in the independent assessment team report.

The remaining F&O ES-D1-01 is identified by the independent assessment team as documentation issue only. SR ES-D1 continues to be met, as identified in the independent assessment team report.

Therefore, each SR of the fire PRA standard has been determined to meet at least capability category II by the peer review team or the independent assessment team. The remaining five open finding level F&Os for the fire PRA have been resolved or involve only a documentation update.

Table 2 Davis-Besse Fire PRA Focused-Scope Peer Review Facts & Observations

F&O #	Review Element	Level	Other Affected SRs	Issue
ES-A1-01	ES	F	PRM-B10	**Discussion of Issue** Some of the logic gates referenced in the Tables 4 through 10 in the MSO Report (ARS-DB-11-0005) do not properly address the essence of the MSO scenario. Minor model changes will be required to fully address the MSO scenario. Examples include: ▪ MSO Scenario 4 - DC control power dependency for RCPs to allow tripping the RCPs from the MCR is not included under Gate Q01-2-3B (So, gates E766 (for DAN) and E748 (for DBN) should be included under gate Q01-2-3B). ▪ The spurious opening of the PORV is modeled under gate R750 which is under gate Q10. Gate Q10 feeds into sequences for a loss of RCS integrity with a failure of injection or recirculation. Gate Q11 feeds into sequences for a loss of feedwater, loss of RCS integrity, and a failure of injection or recirculation. In those sequences the PORV is assumed to open to relieve the RCS pressure increase due to a loss of feedwater. Review of the logic indicates that R750 should also feed into gate Q11, since a spurious signal holding the PORV open after the pressure release is a valid failure mode. Thus, the current modeling does not properly address the MSO in cases where feedwater is lost, but this can be remedied by placing R750 as an input to gate Q11. **Basis For Significance:** Improper modeling of scenarios could lead to inaccurate quantification results and potential misapplication of results. **Possible Resolution:** Correct the identified modeling issues and address similar issues that may exist.
ES-A1-02	ES	F	PRM-B10	**Discussion of Issue** Some of the logic gates referenced in the Tables 4 through 10 in the MSO Report (ARS-DB-11-0005) do not include all the support systems. ▪ MSO Scenario 4 - DC control power dependency for RCPs to allow tripping the RCPs from the MCR is not included under Gate Q01-2-3B. Gates E766 (for DAN) and E748 (for DBN) should be included under gate Q01-2-3B. ▪ MSO Scenario 16 - Failure of power to the associated SFAS cabinets (from panels Y1 and Y3, or Y2 and Y4) should be conservatively modeled to fail the diesel due to failure of the sequencer. This is not currently in the PRA model. **Basis For Significance:**

Table 2 Davis-Besse Fire PRA Focused-Scope Peer Review Facts & Observations

F&O #	Review Element	Level	Other Affected SRs	Issue
				Missing support system dependencies could underestimate the impact of the MSO scenario. **Possible Resolution:** Add the required support system dependencies.
ES-A1-03	ES	F	PRM-B10	**Discussion of Issue** A review of Tables 4 through 10 in the MSO Report (ARS-DB-11-0005) and the DB Fire PRA fault tree model indicate that some pseudo logic was used to capture cable impacts in lieu of detailed logic modeling. Examples include: ▪ MSO Scenario 4 - The cables from the DC busses that supply control power to the RCP breakers are included in the cable selection for the breakers. ▪ MSO Scenario 46 - The cables associated with the sequencer were traced. The cables include the cabling from the power supply busses to the SFAS cabinets, as well as control cabling to the EDGs and C1 and D1 busses. The cables were associated with 'components' SXSEQ1SEQ1 (for SFAS channels 1 and 3) and SXSEQ2SEQ2 (for SFAS channels 2 and 4) in the SAFE software and level 1 failure reports, and were mapped to EDG 1 and EDG 2 Failures to start in FRANX, respectively. Since the complimentary channels were bundled together in this mapping, it will conservatively fail an EDG if the power cable to only one SFAS cabinet is impacted by the fire. **Basis For Significance:** Incomplete mapping of fire impacted cables could underestimate the MSO impact. **Possible Resolution:** Explicitly model support system dependencies or confirm that the necessary cables have been captured under the pseudo logic.
ES-D1-01	ES	F	PRM-B10	**Discussion of Issue** Some of the logic gates referenced in the Tables 4 through 10 in the MSO Report (ARS-DB-11-0005) do not properly address the essence of the MSO scenario. Minor model changes will be required to fully address the MSO scenario. Examples include: ▪ MSO Scenarios 18 and 19 – This MSO references gate R700, which does not address spurious PORV opening. The correct gate should have been gate R750.

Table 2 Davis-Besse Fire PRA Focused-Scope Peer Review Facts & Observations

F&O #	Review Element	Level	Other Affected SRs	Issue
				▪ MSO Scenario 38 – This MSO references gates M154 and M070. The correct gates should have been gates M108 and M118. **Basis For Significance:** This is a documentation issue which could introduce uncertainties about the completeness of the MSO analysis. **Possible Resolution:** Update the MSO documentation to properly reflect the model elements that address the MSO issue.
FQ-A1-01	FQ	F	CF-A1, CS-A2	**Discussion of Issue** During a review of MSO Scenario 18 related to spurious operation of a pressurizer PORV, it was identified that a spurious operation value of 0.29 was applied to BE RRZRC2AS-2SUUTSAG. The basis for spurious operation probability (0.29) was provided as It is an ungrounded DC control circuit for a Solenoid Operated valve, and uses the mean value from NUREG/CR-7150 Table 5-2, row 1 column 6 (Aggregate of all failure modes). That value is for ungrounded DC double break circuits (thermoset). It was identified that, based on E52B Sh. 13 that only the “M” and “Q” cables are associated with a double break design and that the valve control circuit used to energize the “4” relay and open the valve are a single break design, and that, as a minimum, the “P” and the “M” cables are thermoset single break circuits and should be using Table 4-1 of NUREG/CR-7150 Volume 2. It appears that inter-cable, intra-cable and GFEHS could result in spurious PORV opening on both of these cables. The aggregate value (mean) for that configuration is 0.56. Therefore, it appears that values for spurious operation probability for the pressurizer PORVs did not use the correct values from NUREG/CR-7150 in all instances. **Basis For Significance:** Applying incorrect values to circuit failure probabilities could potentially affect fire risk quantification results, depending upon the specific fire scenarios. **Possible Resolution:** Review the PORV circuitry to ensure the single break and double break circuitry is correct in the Detailed Circuit analysis and circuit failure mode likelihood analysis. Ensure these results are accurately included in the Fire PRA model. Review the circuit failure likelihood analysis results for other unique types of failure modes.

Seismic PRA The Davis-Besse seismic PRA model was peer reviewed by the PWR Owners Group peer review program in July 2014. The review was performed against the requirements of ASME/ANS RA-Sa-2009, Part 5, including Clarifications and Qualifications provided in the NRC endorsement of the Standard contained in Revision 2 to RG 1.200. The peer review was performed using the process defined in NEI 12-13, Revision 0 (Reference 12).

All F&Os originating from the Seismic PRA peer review were addressed using FENOC's PRA program to disposition each individual F&O, thus ensuring the model satisfies the PRA standard requirements.

The October 2017 independent assessment and closeout review addressed FENOC's disposition to all F&Os from the Seismic PRA peer review. The review was conducted consistent with NEI 05-04/07-12/12-13 Appendix X, "Fact & Observation (F&O) Close-Out with Independent Assessment." Each member of the independent assessment team met the ASME standard criteria for independence from the Davis-Besse Seismic PRA and the relevant peer reviewer qualifications for the F&Os being reviewed. Each F&O documented closure was reviewed by the team to determine if the F&O had been adequately addressed and can therefore be closed out using the appropriate parts of the ASME/ANS-RA-Sa-2009 PRA standard. The relevant SRs were also re-assessed for cases where the peer review identified the SR as not meeting capability category II. The independent assessment for seismic PRA closed all F&Os and determined each associated SR to meet at least capability category II.

During the independent assessment, the F&O dispositions associated with four SRs (SHA-G1, SHA-H1, SHA-I1, and SPR-E6) related to seismic hazard assessment and large early release analysis, were determined by the independent assessment team to be an upgrade, rather than an update. A focused scope peer review was held, and the team concluded that these SRs were met to at least capability category II with no new findings.

Therefore, each SR of the seismic PRA standard has been determined to meet at least capability category II by the peer review team or the independent assessment team, and there are no remaining open F&Os.

2.4 Consistency with Applicable PRA Standards

Based on the peer reviews, independent assessment of F&O resolutions, the focused scope peer reviews, and the disposition of the remaining five open findings for the fire PRA, FENOC concludes that the current Davis-Besse internal events, fire, and seismic PRA models conform to capability category II of ASME RA-Sb-2009, ASME/ANS Standard for Probabilistic Risk Assessment of Nuclear Power Plant Applications as endorsed by RG 1.200, Revision 2 with the exception of SY-B10, which meets capability category I. This meets the NEI 04-10, Revision 1, requirements for PRA technical adequacy.

2.5 Identification of Key Assumptions

The NEI 04-10 process is a risk-informed process with the PRA model results providing one of the inputs to the IDP to determine if an STI change is acceptable. The NEI 04-10 methodology recognizes that a key area of uncertainty for a risk analysis is the standby failure rate utilized in the determination of the STI extension impact. Therefore, the methodology requires the performance of selected sensitivity studies on the standby failure rate of the component(s) of interest for the STI assessment.

The results of the standby failure rate sensitivity study, plus the results of any additional sensitivity studies identified during the performance of the reviews as outlined in Section 2.2 above, will be assessed for their potential impacts for each STI change assessment where refined analyses are required. It is also noted that key assumptions may differ based on the system being considered for an STI change. Therefore, for each assessment of the PRA model, assumptions and key sources of uncertainty will be reviewed, key assumptions for a particular risk analysis will be identified, and the impact of these key assumptions on the risk insights will be assessed. These assessments will be included in the results of the risk analysis reviewed by the IDP.

3.0 EXTERNAL EVENTS CONSIDERATIONS

The NEI 04-10 methodology evaluates the potential impact on risk due to fires, seismic, other external events, and from shutdown conditions. NEI 04-10 allows for STI change evaluations to be performed in the absence of quantifiable PRA models for these 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 Davis-Besse Individual Plant Examination of External Events (IPEEE) submittal in response to the NRC IPEEE Program of Generic Letter 88-20, Supplement 4 (Reference 7). 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 NRC transmitted to FENOC on February 8, 2001 their review and Staff Evaluation Report of the Davis-Besse IPEEE submittal (Reference 8).

<u>Fire Risk</u>

The internal fire events were addressed in the IPEEE by using the Fire-Induced Vulnerability Evaluation (FIVE) methodology supplemented by PRA methods for four compartments which did not screen below the FIVE compartment-specific core damage frequency. The FIVE results will be used, consistent with NEI 04-10, to assess fire risk insights by qualitative consideration of the potential impact of the fire hazard.

Davis-Besse is transitioning to NFPA 805, and the NRC staff has issued the Safety Evaluation (SE) Report for license amendment 298, June 21, 2019, Section 3.4.3, which concludes that the fire PRA is of sufficient technical quality (Reference 13). Until NFPA 805 is fully implemented at Davis-Besse, the Fire PRA model will only be used for insights for the determination of acceptability of fire risk impacts associated with changes to STIs to supplement the qualitative insights from the IPEEE analysis. After implementing NFPA 805 at Davis-Besse, the Fire PRA model will become effective and be used for the determination of acceptability of fire risk impacts associated with changes to STIs consistent with NEI 04-10.

<u>Seismic Risk</u>

The Davis-Besse Seismic PRA model is integrated with the effective PRA model, PRA-DB1-AL-R06, and will be used for the determination of acceptability of seismic risk impacts associated with changes to STIs.

<u>High Winds, Floods, and Other External Events</u>

High winds, floods, and other external hazards were evaluated in the IPEEE by using a progressive screening approach of Section 5 of NUREG-1407 (Reference 9). No unique

vulnerabilities were identified, and all hazards were screened as low risk. Insights from this evaluation will be used, consistent with NEI 04-10, to qualitatively analyze the risk impacts of these hazards associated with changes to STIs.

4.0 SHUTDOWN EVENTS CONSIDERATIONS

The Davis-Besse PRA does not have a low power/shutdown PRA model. Consistent with NEI 04-10, a qualitative evaluation of shutdown risk impacts associated with changes to STIs will be conducted using the existing defense-in-depth shutdown safety assessment which is based on the principles contained in NUMARC 91-06 (Reference 10).

5.0 SUMMARY

The requirements for quantitative and qualitative risk assessments to support implementation of the Surveillance Frequency Control Program delineated in NEI 04-10, Revision 1, are met for Davis-Besse based on the technical adequacy of the internal events, internal flooding, fire, and seismic PRA models. This provides the capability to quantitatively assess internal events, internal flooding, and seismic risk due to changes in the STI, and by the qualitative assessments of fire and other external hazards as described.

6.0 REFERENCES

1. NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," April 2007 (ADAMS Accession No. ML071360456).

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

3. ASME RA-Sb-2005, "Addenda to ASME RA-S-2002 Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," December 2005.

4. Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2, March 2009.

5. ASME RA-Sa-2009, "Addenda to ASME/ANS RA-S-2008, Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," February 2009.

6. NEI 05-04/07-12/12-13 Appendix X: Close Out of Facts and Observations(F&Os) (ADAMS Accession No. ML17086A451), March 2017.

7. Centerior Energy, "Individual Plant Examination of External Events for Severe Accident Vulnerabilities for the Davis-Besse Nuclear Power Station, Unit 1 (Response to Generic Letter 88-20, Supplement 4)," December 16, 1996.

8. Letter from Stephen P. Sands (USNRC) to Mr. Guy G. Campbell, FirstEnergy Nuclear Operating Company, “Davis-Besse Nuclear Power Station Unit 1 – Review of Individual Plant Examination of External Events (TAC No. M83613),” February 8, 2001.

9. NUREG-1407, “Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities,” June 1991.

10. NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," December 1991 (ADAMS Accession No. ML14365A203).

11. NEI 07-12 Rev. 1, “Fire Probabilistic Risk Assessment (FPRA) Peer Review Process Guidelines,” June 2010 (ADAMS Accession No. ML102230070).

12. NEI 12-13, “External Hazards PRA Peer Review Process Guidelines,” August 2012 (ADAMS Accession No. ML12240A027).

13. Davis-Besse License Amendment 298, “Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Transition to a Risk-Informed, Performance-Based Fire Protection Program,” June 2019 (ADAMS Accession No. ML19100A306).

14. 2P008-RPT-01, Davis-Besse Fire PRA Focused-Scope Peer Review, November 2017.

15. PWROG-17073-P, Davis-Besse Independent Assessment of Internal Events, Internal Flood, Seismic, and Fire PRA Facts & Observations Closure, February 2018.

Attachment
L-19-233

TSTF-425 Versus Davis-Besse Nuclear Power Station (DBNPS) Cross Reference

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Definitions	**1.1**	**1.1**	
REACTIVITY CONTROL SYSTEMS – SHUTDOWN MARGIN (SDM)	**3.1.1**	**3.1.1**	
Verify SDM within limits	3.1.1.1	3.1.1.1	
REACTIVITY CONTROL SYSTEMS – Reactivity Balance	**3.1.2**	**3.1.2**	
Verify measured core reactivity balance	3.1.2.1	3.1.2.1	
REACTIVITY CONTROL SYSTEMS – CONTROL ROD Group Alignment Limits	**3.1.4**	**3.1.4**	
Verify individual CONTROL ROD positions	3.1.4.1	3.1.4.1	
Verify CONTROL ROD freedom of movement	3.1.4.2	3.1.4.2	
REACTIVITY CONTROL SYSTEMS – Safety Rod Insertion Limits	**3.1.5**	**3.1.5**	
Verify each safety rod is fully withdrawn	3.1.5.1	3.1.5.1	
REACTIVITY CONTROL SYSTEMS – AXIAL POWER SHAPING ROD (APSR) Alignment Limits	**3.1.6**	**3.1.6**	
Verify position of each APSR	3.1.6.1	3.1.6.1	
REACTIVITY CONTROL SYSTEMS – Position Indicator Channels	**3.1.7**	**3.1.7**	
Verify the absolute and relative position indicator channels agree	3.1.7.1	3.1.7.1	
REACTIVITY CONTROL SYSTEMS – PHYSICS TESTS Exceptions – MODE 1	**3.1.8**	**3.1.8**	
Verify THERMAL POWER	3.1.8.1	3.1.8.1	
Perform SR 3.2.5.1	3.1.8.2	3.1.8.2	
Verify nuclear overpower trip setpoint	3.1.8.3	3.1.8.3	The Davis-Besse term “High Flux” corresponds with TSTF-425 “nuclear overpower” – this nomenclature difference does not impact the SR frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify SDM	3.1.8.4	3.1.8.4	
REACTIVITY CONTROL SYSTEMS – PHYSICS TESTS Exceptions – MODE 2	**3.1.9**	**3.1.9**	
Verify THERMAL POWER	3.1.9.1	3.1.9.3	
Verify nuclear overpower trip setpoint	3.1.9.2	---------	
Verify the RCS lowest loop average temperature	---------	3.1.9.2	VARIATION: The Davis-Besse TS includes a periodic SR for RCS lowest loop average temperature verification every 30 minutes during PHYSICS TESTS – meets criteria for inclusion in the scope of the SFCP.
Verify SDM	3.1.9.3	3.1.9.4	
POWER DISTRIBUTION LIMITS – Regulating Rod Insertion Limits	**3.2.1**	**3.2.1**	
Verify regulating rod groups are within the sequence and overlap limits	3.2.1.1	3.2.1.1	
Verify regulating rod groups meet the insertion limits	3.2.1.2	3.2.1.2	
POWER DISTRIBUTION LIMITS – AXIAL POWER SHAPING ROD (APSR) Insertion Limits	**3.2.2**	**3.2.2**	
Verify APSRs are within acceptable limits	3.2.2.1	3.2.2.1	
POWER DISTRIBUTION LIMITS – AXIAL POWER IMBALANCE Operating Limits	**3.2.3**	**3.2.3**	
Verify AXIAL POWER IMBALANCE	3.2.3.1	3.2.3.1	
POWER DISTRIBUTION LIMITS – QUADRANT POWER TILT (QPT)	**3.2.4**	**3.2.4**	
Verify QPT	3.2.4.1	3.2.4.1	
INSTRUMENTATION – Reactor Protection System (RPS) Instrumentation	**3.3.1**	**3.3.1**	
Perform CHANNEL CHECK	3.3.1.1	3.3.1.1	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Compare result of calorimetric heat balance calculation to power range channel output	3.3.1.2	3.3.1.2	Davis-Besse differs from TSTF-425 in wording of NOTE 1 to provide a more explicit criterion for when channel adjustment is required – this difference does not impact the SR frequency or applicability of TSTF-425.
Compare results of out of core measured AXIAL POWER IMBALANCE (API_0) to incore measured AXIAL POWER IMBALANCE (API_1)	3.3.1.3	3.3.1.4	The Davis-Besse term “offset error” is equivalent to TSTF-425 “imbalance error” – this nomenclature difference does not impact the SR frequency or applicability of TSTF-425.
Perform CHANNEL FUNCTIONAL TEST	3.3.1.4	3.3.1.5	
Perform CHANNEL CALIBRATION	3.3.1.5	3.3.1.3, 3.3.1.6, 3.3.1.7	VARIATION: The Davis-Besse TS has three separate CHANNEL CALIBRATION SRs with unique frequencies for different Functions of LCO 3.3.1. This is an administrative variation where the single TSTF-425 SR is simply split into three separate SRs, but each meets the criteria for inclusion in the SFCP. SR 3.3.1.3 and 3.3.1.7 include a note related to flow rate measurement sensors and the CHANNEL CALIBRATION –this difference does not impact the SR frequency or applicability of TSTF-425.
Verify RPS RESPONSE TIME	3.3.1.6	3.3.1.8	
INSTRUMENTATION – Reactor Protection System (RPS)-Reactor Trip Module (RTM)	**3.3.3**	**3.3.3**	
Perform CHANNEL FUNCTIONAL TEST	3.3.3.1	3.3.3.1	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
INSTRUMENTATION – CONTROL ROD Drive (CRD) Trip Devices	**3.3.4**	**3.3.4**	
Perform CHANNEL FUNCTIONAL TEST	3.3.4.1	3.3.4.1, 3.3.4.2	VARIATION: The Davis-Besse TS has two separate CHANNEL FUNCTIONAL TEST SRs with a separate frequency for SCR relay trip channels. This is an administrative variation where the single TSTF-425 SR is simply split into two separate SRs, but each meets the criteria for inclusion in the SFCP.
INSTRUMENTATION – Engineered Safety Feature Actuation System (ESFAS) Instrumentation	**3.3.5**	**3.3.5**	The Davis-Besse LCO title is Safety Features Actuation System (SFAS) Instrumentation.
Perform CHANNEL CHECK	3.3.5.1	3.3.5.1	
Perform CHANNEL FUNCTIONAL TEST	3.3.5.2	3.3.5.2	
Perform CHANNEL CALIBRATION	3.3.5.3	3.3.5.3, 3.3.5.4	VARIATION: Davis-Besse has two separate CHANNEL CALIBRATION SRs with separate frequencies for different Parameters. This is an administrative variation where the single TSTF-425 SR is simply split into two separate SRs, but each meets the criteria for inclusion in the SFCP.
Verify ESFAS RESPONSE TIME	3.3.5.4	3.3.5.5	
INSTRUMENTATION – Engineered Safety Feature Actuation System (ESFAS) Manual Initiation	**3.3.6**	**3.3.6**	The Davis-Besse LCO title is Safety Features Actuation System (SFAS) Manual Initiation.
Perform CHANNEL FUNCTIONAL TEST	3.3.6.1	3.3.6.1	
INSTRUMENTATION – Engineered Safety Feature Actuation System (ESFAS) Automatic Actuation Logic	**3.3.7**	**3.3.7**	The Davis-Besse LCO title is Safety Features Actuation System (SFAS) Automatic Actuation Logic.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Perform automatic actuation logic CHANNEL FUNCTIONAL TEST	3.3.7.1	3.3.7.1	The Davis-Besse SR specifies automatic actuation “output” logic – this difference does not impact the SR frequency or applicability of TSTF-425.
INSTRUMENTATION – Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)	**3.3.8**	**3.3.8**	
Perform CHANNEL CHECK	3.3.8.1	---------	
Perform CHANNEL FUNCTIONAL TEST	3.3.8.2	3.3.8.1	Davis-Besse has an additional NOTE for this SR regarding the as-left instrument setting – this difference does not impact the SR frequency or applicability of TSTF-425.
Perform CHANNEL CALIBRATION with Allowable Value	3.3.8.3	3.3.8.2	Davis-Besse has an additional NOTE for this SR regarding the as-left instrument setting; Davis-Besse also identifies the time delays without a nominal setpoint (i.e., ≥ X and ≤ Y, rather than N +/- M – these differences do not impact the SR frequency or applicability of TSTF-425.
INSTRUMENTATION – Source Range Neutron Flux	**3.3.9**	**3.3.9**	
Perform CHANNEL CHECK	3.3.9.1	3.3.9.1	
Perform CHANNEL CALIBRATION	3.3.9.2	3.3.9.2	
INSTRUMENTATION – Intermediate Range Neutron Flux	**3.3.10**	**3.3.10**	
Perform CHANNEL CHECK	3.3.10.1	3.3.10.1	
Perform CHANNEL CALIBRATION	3.3.10.2	3.3.10.2	
INSTRUMENTATION – Emergency Feedwater Initiation and Control (EFIC) System Instrumentation	**3.3.11**	**3.3.11**	The Davis-Besse LCO title is Steam and Feedwater Rupture Control System (SFRCS) Instrumentation.
Perform CHANNEL CHECK	3.3.11.1	3.3.11.1	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Perform CHANNEL FUNCTIONAL TEST	3.3.11.2	3.3.11.2	Davis-Besse has a NOTE regarding delay of entry into Conditions and Required Actions – this difference does not impact the SR frequency or applicability of TSTF-425.
Perform CHANNEL CALIBRATION	3.3.11.3	3.3.11.3, 3.3.11.4	VARIATION: Davis-Besse has two separate CHANNEL CALIBRATION SRs with separate frequencies for different Functions. This is an administrative variation where the single TSTF-425 SR is simply split into two separate SRs, but each meets the criteria for inclusion in the SFCP.
Verify EFIC RESPONSE TIME	3.3.11.4	3.3.11.5	Davis-Besse has a NOTE providing a clarification for implementation of the STAGGERED TEST BASIS; upon relocation of the SR frequency to the SFCP, the note will no longer be needed and will be deleted.
INSTRUMENTATION – Emergency Feedwater Initiation and Control (EFIC) Manual Initiation	**3.3.12**	**3.3.12**	Davis-Besse LCO title is Steam and Feedwater Rupture Control System (SFRCS) Manual Initiation.
Perform CHANNEL FUNCTIONAL TEST	3.3.12.1	3.3.12.1	Davis-Besse has different frequency (24 months) compared to TSTF-425 (31 days) – the existing plant-specific SR frequency is a periodic value, and therefore does not impact the applicability of TSTF-425.
INSTRUMENTATION – Emergency Feedwater Initiation and Control (EFIC) Logic	**3.3.13**	**3.3.13**	The Davis-Besse LCO title is Steam and Feedwater Rupture Control System (SFRCS) Actuation.
Perform CHANNEL FUNCTIONAL TEST	3.3.13.1	3.3.13.1	Davis-Besse has a NOTE regarding delay of entry into Conditions and Required Actions – this difference does not impact the SR frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
INSTRUMENTATION – Emergency Feedwater Initiation and Control (EFIC) – Emergency Feedwater (EFW) – Vector Valve Logic	**3.3.14**	**---------**	
INSTRUMENTATION – Reactor Building (RB) Purge Isolation – High Radiation	**3.3.15**	**---------**	
INSTRUMENTATION – Control Room Isolation – High Radiation	**3.3.16**	**3.3.15**	The Davis-Besse LCO title is Station Vent Normal Range Radiation Monitoring.
Perform CHANNEL CHECK	3.3.16.1	3.3.15.1	
Perform CHANNEL FUNCTIONAL TEST	3.3.16.2	3.3.15.2	Davis-Besse differs from TSTF-425 in wording of NOTE which includes a restriction on OPERABILITY of the redundant channel – this difference does not impact the SR frequency or applicability of TSTF-425.
Perform CHANNEL CALIBRATION with setpoint Allowable Value ≤ [25] mR/hr	3.3.16.3	3.3.15.3	The Davis-Besse SR does not specify the setpoint Allowable Value – this difference does not impact the SR frequency or applicability of TSTF-425.
INSTRUMENTATION – Fuel Handling Exhaust – High Radiation	**---------**	**3.3.14**	The Davis-Besse TS has a plant-specific LCO for Fuel Handling Exhaust – High Radiation with periodic SRs.
Perform CHANNEL CHECK	---------	3.3.14.1	VARIATION: Plant-specific periodic SR – meets the criterion for inclusion in the SFCP.
Perform CHANNEL FUNCTIONAL TEST	---------	3.3.14.2	VARIATION: Plant-specific time-based SR – meets the criterion for inclusion in the SFCP.
Perform CHANNEL CALIBRATION	---------	3.3.14.3	VARIATION: Plant-specific time-based SR – meets the criterion for inclusion in the SFCP.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
INSTRUMENTATION - Anticipatory Reactor Trip System (ARTS)	**---------**	**3.3.16**	The Davis-Besse TS has a plant-specific LCO for Anticipatory Reactor Trip System (ARTS) Instrumentation with periodic SRs.
Perform CHANNEL CHECK	---------	3.3.16.1	VARIATION: Plant-specific time-based SR – meets the criterion for inclusion in the SFCP.
Perform CHANNEL FUNCTIONAL TEST	---------	3.3.16.2	VARIATION: Plant-specific time-based SR – meets the criterion for inclusion in the SFCP.
Perform CHANNEL CALIBRATION	---------	3.3.16.3	VARIATION: Plant-specific time-based SR – meets the criterion for inclusion in the SFCP.
INSTRUMENTATION – Post Accident Monitoring (PAM) Instrumentation	**3.3.17**	**3.3.17**	
Perform CHANNEL CHECK	3.3.17.1	3.3.17.1	
Perform CHANNEL CALIBRATION	3.3.17.2	3.3.17.2, 3.3.17.3	VARIATION: Davis-Besse has two separate CHANNEL CALIBRATION SRs with separate frequencies for different Functions. This is an administrative variation where the single TSTF-425 SR is simply split into two separate SRs, but each meets the criteria for inclusion in the SFCP.
INSTRUMENTATION – Remote Shutdown System	**3.3.18**	**3.3.18**	
Perform CHANNEL CHECK	3.3.18.1	3.3.18.1	
Verify each required control circuit and transfer switch is capable of performing the intended function	3.3.18.2	3.3.18.3	The Davis-Besse SR more clearly defines “required” compared to TSTF-425 – this difference does not impact the SR frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Perform CHANNEL CALIBRATION	3.3.18.3	3.3.18.2	The Davis-Besse SR NOTE does not include exclusion of neutron detectors, but does exclude reactor trip breaker indication and control rod position switches from CHANNEL CALIBRATION – this difference does not impact the SR frequency or applicability of TSTF-425.
REACTOR COOLANT SYSTEM (RCS) – RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits	**3.4.1**	**3.4.1**	
Verify RCS loop pressure	3.4.1.1	3.4.1.1	
Verify RCS hot leg temperature	3.4.1.2	3.4.1.2	
Verify RCS total flow	3.4.1.3	3.4.1.3	The Davis-Besse SR uses units of gpm instead of lbm/hr – this does not impact the SR frequency or applicability of TSTF-425.
Verify RCS total flow rate	3.4.1.4	3.4.1.4	The Davis-Besse NOTE is worded differently, specifying a 24-hour period after stable thermal conditions are established – this difference does not impact the SR frequency or applicability of TSTF-425.
REACTOR COOLANT SYSTEM (RCS) – RCS Minimum Temperature for Criticality	**3.4.2**	**3.4.2**	
Verify RCS T_{avg} in each loop	3.4.2.1	3.4.2.1	
REACTOR COOLANT SYSTEM (RCS) – RCS Pressure and Temperature (P/T) Limits	**3.4.3**	**3.4.3**	
Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates	3.4.3.1	3.4.3.1	
REACTOR COOLANT SYSTEM (RCS) – RCS Loops – MODES 1 and 2	**3.4.4**	**3.4.4**	
Verify required RCS loops are in operation	3.4.4.1	3.4.4.1	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
REACTOR COOLANT SYSTEM (RCS) – RCS Loops – MODE 3	**3.4.5**	**3.4.5**	
Verify one RCS loop is in operation	3.4.5.1	3.4.5.1	
Verify correct breaker alignment and indicated power available to each required pump	3.4.5.2	3.4.5.3	
Verify SG secondary side water level	---------	3.4.5.2	VARIATION: The Davis-Besse TS includes a periodic SR for steam generator secondary side water level – meets criterion for inclusion in SFCP.
REACTOR COOLANT SYSTEM (RCS) – RCS Loops – MODE 4	**3.4.6**	**3.4.6**	
Verify required DHR or RCS loop is in operation	3.4.6.1	3.4.6.1	
Verify correct breaker alignment and indicated power available to each required pump	3.4.6.2	3.4.6.3	
Verify SG secondary side water level	---------	3.4.6.2	VARIATION: The Davis-Besse TS includes a periodic SR for SG secondary side water level – meets criterion for inclusion in SFCP.
REACTOR COOLANT SYSTEM (RCS) – RCS Loops – MODE 5, Loops Filled	**3.4.7**	**3.4.7**	
Verify required DHR loop is in operation	3.4.7.1	3.4.7.1	The Davis-Besse LCO allows either a DHR or an RCS loop to be in operation, so the SR text is “DHR or RCS loop” instead of “DHR loop”– this does not impact the surveillance frequency or applicability of TSTF-425.
Verify SG secondary side water level	3.4.7.2	3.4.7.2	The Davis-Besse SR uses units of “inches above the lower tube sheet” instead of “%”, and specifies “…, for each required RCS loop…” instead of “…required…” – these differences do not impact the surveillance frequency or applicability of TSTF-425.
Verify correct breaker alignment and indicated power available to each required DHR pump	3.4.7.3	3.4.7.3	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
REACTOR COOLANT SYSTEM (RCS) – RCS Loops – MODE 5, Loops Not Filled	**3.4.8**	**3.4.8**	
Verify required DHR loop is in operation	3.4.8.1	3.4.8.1	
Verify correct breaker alignment and indicated power available to each required DHR pump	3.4.8.2	3.4.8.2	
REACTOR COOLANT SYSTEM (RCS) – Pressurizer	**3.4.9**	**3.4.9**	
Verify pressurizer water level	3.4.9.1	3.4.9.1	
Verify ≥ [126] kW of pressurizer heaters are capable of being powered from an emergency power supply.	3.4.9.2	3.4.9.2	The Davis-Besse SR verifies capacity of available heaters only and does not require verification of the capability to be powered from an emergency power supply – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify emergency power supply for pressurizer heaters	3.4.9.3	---------	
REACTOR COOLANT SYSTEM (RCS) – Pressurizer Pilot Operated Relief Valve (PORV)	**3.4.11**	**3.4.11**	
Perform one complete cycle of the block valve	3.4.11.1	3.4.11.1	
Perform one complete cycle of the PORV	3.4.11.2	3.4.11.2	
Verify PORV and block valve are capable of being powered from an emergency power source.	3.4.11.3	---------	
REACTOR COOLANT SYSTEM (RCS) – Low Temperature Overpressure Protection (LTOP) System	**3.4.12**	**3.4.12**	
Verify a maximum of one makeup pump	3.4.12.1	---------	
Verify HPI is deactivated	3.4.12.2	---------	
Verify each CFT is isolated	3.4.12.3	---------	
Verify pressurizer level	3.4.12.4	---------	
Verify PORV block valve open	3.4.12.5	---------	
Verify required RCS vent open	3.4.12.6	---------	
Perform CHANNEL FUNCTIONAL TEST for PORV	3.4.12.7	---------	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Perform CHANNEL CALIBRATION for PORV	3.4.12.8	---------	
Verify RCS to DHR isolation valves open with control power removed	---------	3.4.12.1	VARIATION: Davis-Besse uses open RCS to DHR isolation valves and the DHR System relief valve for LTOP rather than pressurizer PORVs and has a periodic SR for verification of isolation valve status – meets the criterion for inclusion in the scope of the SFCP.
REACTOR COOLANT SYSTEM (RCS) – RCS Operational LEAKAGE	**3.4.13**	**3.4.13**	
Verify RCS operational LEAKAGE	3.4.13.1	3.4.13.1	
Verify primary to secondary LEAKAGE	3.4.13.2	3.4.13.2	
REACTOR COOLANT SYSTEM (RCS) – RCS Pressure Isolation Valve (PIV) Leakage	**3.4.14**	**3.4.14**	
Verify leakage from each RCS PIV	3.4.14.1	3.4.14.2	The Davis-Besse SR NOTE states the SR is only required to be performed in MODES 1 and 2 – this difference does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR does not include the TSTF-425 NOTEs for valves in DHR flow path or for testing of PIVs actuated during the test – this difference does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR does not specify a range for the test pressure (single point), and includes an additional surveillance acceptance limit – this difference does not impact the surveillance frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify DHR System autoclosure interlock prevents the valves from being opened	3.4.14.2	3.4.14.3	The Davis-Besse SR refers to the “interlock function” instead of the “autoclosure interlock” – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify DHR System autoclosure interlock causes the valves to close automatically	3.4.14.3	3.4.14.4	The Davis-Besse SR refers to the “interlock function” instead of the “autoclosure interlock” – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425.
Perform CHANNEL CHECK on the DHR System interlock channel	---------	3.4.14.1	VARIATION: The Davis-Besse TS has a periodic SR for a CHANNEL CHECK on the DHR System interlock channels – meets the criterion for inclusion in SFCP.
Perform CHANNEL CALIBRATION on the DHR System interlock channels	---------	3.4.14.5	VARIATION: The Davis-Besse TS has a periodic SR for a CHANNEL CALIBRATION on the DHR System interlock channels – meets the criterion for inclusion in SFCP.
REACTOR COOLANT SYSTEM (RCS) – RCS Leakage Detection Instrumentation	**3.4.15**	**3.4.15**	
Perform CHANNEL CHECK	3.4.15.1	3.4.15.1	
Perform CHANNEL FUNCTIONAL TEST	3.4.15.2	3.4.15.2	
Perform CHANNEL CALIBRATION	3.4.15.3	3.4.15.4	
Perform CHANNEL CALIBRATION	3.4.15.4	3.4.15.3	
REACTOR COOLANT SYSTEM (RCS) – RCS Specific Activity	**3.4.16**	**3.4.16**	
Verify reactor coolant gross specific activity	3.4.16.1	3.4.16.1	
Verify reactor coolant DOSE EQUIVALENT I-131 specific activity	3.4.16.2	3.4.16.2	
Determine $\bar{E}$	3.4.16.3	3.4.16.3	
EMERGENCY CORE COOLING SYSTEMS (ECCS) – Core Flood Tanks (CFTs)	**3.5.1**	**3.5.1**	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify each CFT isolation valve is fully open	3.5.1.1	3.5.1.1	
Verify borated water volume	3.5.1.2	3.5.1.2	
Verify nitrogen cover pressure	3.5.1.3	3.5.1.3	
Verify boron concentration	3.5.1.4	3.5.1.4	
Verify power is removed from each CFT isolation valve operator	3.5.1.5	3.5.1.5	The Davis-Besse SR does not include the TSTF-425 limitation on applicability of the SR above RCS pressure of 2000 psig – this difference does not impact the surveillance frequency or applicability of TSTF-425.
EMERGENCY CORE COOLING SYSTEMS (ECCS) – ECCS – Operating	**3.5.2**	**3.5.2**	
Verify valve positions and power removed from valve operators	3.5.2.1	---------	
Verify each ECCS valve in the flow path is in the correct position	3.5.2.2	3.5.2.1	
Verify ECCS piping is full of water	3.5.2.3	3.5.2.3	The Davis-Besse SR is more specific regarding the required method of verification – this does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR frequency (24 months) differs from the TSTF-425 frequency (31 days) - the existing plant-specific SR frequency is a periodic value, and therefore does not impact the applicability of TSTF-425.
Verify each ECCS automatic valve actuates to the correct position	3.5.2.5	3.5.2.4	
Verify each ECCS pump starts automatically	3.5.2.6	3.5.2.5	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify the correct position of HPI stop check valves	3.5.2.7	3.5.2.6	The Davis-Besse SR verifies the correct position for each mechanical stop for identified valves but does not specify the valves as HPI stop-check – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify LPI flow controllers operate properly	3.5.2.8	---------	
Verify each ECCS train containment sump visual inspection	3.5.2.9	3.5.2.7	
Verify BWST outlet valve and containment emergency sump valve actuation and time	---------	3.5.2.8	VARIATION: The Davis-Besse TS has a periodic SR for BWST/ containment emergency sump valve actuation – meets the criterion for inclusion in SFCP.
EMERGENCY CORE COOLING SYSTEMS (ECCS) – Borated Water Storage Tank (BWST)	**3.5.4**	**3.5.4**	
Verify BWST borated water temperature	3.5.4.1	3.5.4.1	
Verify BWST borated water volume	3.5.4.2	3.5.4.2	
Verify BWST boron concentration	3.5.4.3	3.5.4.3	
CONTAINMENT SYSTEMS – Containment Air Locks	**3.6.2**	**3.6.2**	
Verify only one door in the air lock can be opened at a time	3.6.2.2	3.6.2.2	
CONTAINMENT SYSTEMS – Containment Isolation Valves	**3.6.3**	**3.6.3**	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify each 48 inch containment purge valve is sealed closed	3.6.3.1	3.6.3.1	The Davis-Besse SR refers to the purge and exhaust valves, and specifies removal of control power for implementation of "sealed closed" – these differences do not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR does not identify the exception in TSTF-425 regarding applicability of Condition D of the LCO – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each [8] inch purge valve is closed	3.6.3.2	---------	
Verify each containment isolation manual valve and blind flange outside containment is closed	3.6.3.3	3.6.3.2	
Verify the isolation time of each automatic power operated containment isolation valve	3.6.3.5	3.6.3.4	The Davis-Besse SR is governed by the INSERVICE TESTING PROGRAM as per Standard TS (STS) and so is excluded from the SFCP.
Perform leakage rate testing for containment purge valves with resilient seals	3.6.3.6	3.6.3.5	The Davis-Besse SR does not include the periodic frequency and so is excluded from the SFCP.
Verify each automatic containment isolation valve actuates to the isolation position	3.6.3.7	3.6.3.6	
Verify each [ ] inch containment purge valve is blocked to restrict the valve from opening > [50]%.	3.6.3.8	---------	
CONTAINMENT SYSTEMS – Containment Pressure	**3.6.4**	**3.6.4**	
Verify containment pressure	3.6.4.1	3.6.4.1	
CONTAINMENT SYSTEMS – Containment Air Temperature	**3.6.5**	**3.6.5**	
Verify containment air temperature	3.6.5.1	3.6.5.1	
CONTAINMENT SYSTEMS – Containment Spray and Cooling Systems	**3.6.6**	**3.6.6**	The Davis-Besse LCO title is Containment Spray and Air Cooling Systems.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify each containment spray valve is in the correct position	3.6.6.1	3.6.6.1	
Operate each required containment cooling train	3.6.6.2	3.6.6.2	
Verify cooling water flow rate	3.6.6.3	3.6.6.5	
Verify each automatic containment spray valve actuates to the correct position	3.6.6.5	3.6.6.6	
Verify each containment spray pump starts automatically	3.6.6.6	3.6.6.7	
Verify each required containment cooling train starts automatically	3.6.6.7	3.6.6.4	
Verify each spray nozzle is unobstructed	3.6.6.8	3.6.6.8	The Davis-Besse SR does not include the periodic frequency and so is excluded from the SFCP.
CONTAINMENT SYSTEMS – Spray Additive System	**3.6.7**	**---------**	
CONTAINMENT SYSTEMS – Trisodium Phosphate Dodecahydrate (TSP) Storage	**---------**	**3.6.7**	Davis-Besse TS has a plant-specific LCO for the Trisodium Phosphate Dodecahydrate (TSP) Storage system with a periodic SR.
Verify contained volume of TSP	---------	3.6.7.1	VARIATION: Plant-specific SR – meets the criterion for inclusion in the SFCP.
PLANT SYSTEMS – Main Steam Isolation Valves (MSIVs)	**3.7.2**	**3.7.2**	
Verify each MSIV actuates	3.7.2.2	3.7.2.2	The Davis-Besse SR does not include a NOTE limiting the applicability of the SR to MODES 1 and 2 – this difference does not impact the surveillance frequency or applicability of TSTF-425.
PLANT SYSTEMS – [Main Feedwater Stop Valves (MFSVs), Main Feedwater Control Valves (MFCVs), and Associated Startup Feedwater Control Valves (SFCVs)]	**3.7.3**	**3.7.3**	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify the isolation time of each MFCV and SFCV	---------	3.7.3.2	VARIATION: The Davis-Besse TS has a separate SR for isolation time verification of MFCVs and SFCVs, which is a periodic surveillance not referenced to the INSERVICE TESTING PROGRAM – meets the criterion for inclusion in the SFCP.
Verify each MFSV, MFCV, and SFCV actuates	3.7.3.2	3.7.3.3	The Davis-Besse SR does not include a NOTE limiting the applicability of the SR to MODES 1 and 2 – this difference does not impact the surveillance frequency or applicability of TSTF-425.
PLANT SYSTEMS – Atmospheric Vent Valves (AVVs)	**3.7.4**	**---------**	
PLANT SYSTEMS – Turbine Stop Valves (TSVs)	**---------**	**3.7.4**	The Davis-Besse TS has a plant-specific LCO for the TSVs with periodic SRs**.**
Verify isolation time of each TSV	---------	3.7.4.1	VARIATION: Plant-specific periodic SR – meets the criterion for inclusion in the SFCP.
Verify each TSV actuates	---------	3.7.4.2	VARIATION: Plant-specific time-based SR – meets the criterion for inclusion in the SFCP.
PLANT SYSTEMS – Emergency Feedwater (EFW) System	**3.7.5**	**3.7.5**	
Verify each EFW valve is in the correct position	3.7.5.1	3.7.5.1	The Davis-Besse SR has a NOTE permitting valves to be misaligned provided they are capable of being locally realigned for low power and shutdown MODEs – this difference does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse equipment name is “AFW” pumps rather than “steam turbine driven” pumps – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify the developed head of each AFW pump	---------	3.7.5.2	VARIATION: Davis-Besse has a periodic SR for AFW pump testing not referenced to the INSERVICE TESTING PROGRAM – meets the criterion for inclusion in the SFCP.
Operate the MDFP train	---------	3.7.5.3	VARIATION: Davis-Besse has a periodic SR for operating the motor-driven feed pump train – meets the criterion for inclusion in the SFCP.
Verify each EFW automatic valve actuates	3.7.5.3	3.7.5.4	The Davis-Besse equipment name is “AFW” – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR does not include a NOTE excluding MODE 4 – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each EFW pump starts automatically	3.7.5.4	3.7.5.5	The Davis-Besse equipment name is “AFW” – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR does not include a NOTE excluding MODE 4 – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Perform a CHANNEL FUNCTIONAL TEST for the EFW pump suction pressure interlocks	3.7.5.6	---------	
Perform a CHANNEL CALIBRATION for the EFW pump suction pressure interlocks	3.7.5.7	---------	
Perform CHANNEL CHECK on each AFW train Steam Generator Level Control System	---------	3.7.5.8	VARIATION: The Davis-Besse TS has a periodic SR for a CHANNEL CHECK on the Steam Generator Level Control System – meets the criteria for inclusion in the SFCP.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Perform CHANNEL FUNCTIONAL TEST on each AFW train Steam Generator Level Control System	---------	3.7.5.9	VARIATION: The Davis-Besse TS has a periodic SR for a CHANNEL FUNCTIONAL TEST on the Steam Generator Level Control System – meets the criteria for inclusion in the SFCP.
Perform CHANNEL CALIBRATION on each AFW train Steam Generator Level Control System	---------	3.7.5.10	VARIATION: The Davis-Besse TS has a periodic SR for a CHANNEL CALIBRATION on the Steam Generator Level Control System – meets the criteria for inclusion in the SFCP.
PLANT SYSTEMS – Condensate Storage Tank (CST)	**3.7.6**	**3.7.6**	
Verify CST level	3.7.6.1	3.7.6.1	Davis-Besse has two CSTs instead of a single CST required to meet the LCO – this difference does not impact the surveillance frequency or applicability of TSTF-425. The Davis-Besse SR uses the term “usable volume” instead of “level” – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425.
PLANT SYSTEMS – Component Cooling Water (CCW) System	**3.7.7**	**3.7.7**	
Verify each CCW valve is in the correct position	3.7.7.1	3.7.7.1	
Verify each CCW valve actuates	3.7.7.2	3.7.7.2	
Verify each CCW pump starts automatically	3.7.7.3	3.7.7.3	The Davis-Besse SR has “required” – this difference does not impact the surveillance frequency or applicability of TSTF-425.
PLANT SYSTEMS – Service Water System (SWS)	**3.7.8**	**3.7.8**	
Verify each SWS valve is in the correct position	3.7.8.1	3.7.8.1	
Verify each SWS valve actuates	3.7.8.2	3.7.8.2	
Verify each SWS pump starts automatically	3.7.8.3	3.7.8.3	The Davis-Besse SR has “required” – this difference does not impact the surveillance frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
PLANT SYSTEMS – Ultimate Heat Sink (UHS)	**3.7.9**	**3.7.9**	
Verify water level of UHS	3.7.9.1	3.7.9.1	
Verify average water temperature of UHS	3.7.9.2	3.7.9.2	
Operate each cooling tower fan	3.7.9.3	---------	
PLANT SYSTEMS – Control Room Emergency Ventilation System (CREVS)	**3.7.10**	**3.7.10**	
Operate each CREVS train	3.7.10.1	3.7.10.1	
Verify [each CREVS train actuates] [or the control room isolates]	3.7.10.3	3.7.10.3	
Verify one CREVS train can maintain a positive pressure	3.7.10.4	---------	
Verify the system makeup flow rate	3.7.10.5	3.7.10.5	
PLANT SYSTEMS – Control Room Emergency Air Temperature Control System (CREATCS)	**3.7.11**	**3.7.11**	
Verify each CREATCS train has the capability to remove the assumed heat load	3.7.11.1	3.7.11.1	
PLANT SYSTEMS – Emergency Ventilation System (EVS)	**3.7.12**	**3.7.12**	The Davis-Besse LCO title is Station EVS.
Operate each EVS train	3.7.12.1	3.7.12.1	
Verify each EVS train actuates	3.7.12.3	3.7.12.3	
Verify one EVS train can maintain pressure	3.7.12.4	3.7.12.4	The Davis-Besse SR is worded to “maintain a negative pressure” rather than “maintain a pressure ≤”; the Davis-Besse SR also specifies the annulus as the point of measurement – these differences do not impact the surveillance frequency or applicability of TSTF-425.
Verify each EVS filter cooling bypass damper can be opened	3.7.12.5	3.7.12.5	
PLANT SYSTEMS – Fuel Storage Pool Ventilation System (FSPVS)	**3.7.13**	**3.7.13**	The Davis-Besse LCO title is Spent Fuel Pool Area Emergency Ventilation System (EVS).

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Operate each FSPVS train	3.7.13.1	3.7.13.1	
Verify each FSPVS train actuates	3.7.13.3	3.7.13.3	
Verify one FSPVS train can maintain pressure	3.7.13.4	3.7.13.4	The Davis-Besse SR is worded to “maintain a negative pressure” rather than “maintain a pressure ≤” – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each FSPVS filter bypass damper can be opened	3.7.13.5	3.7.13.5	
PLANT SYSTEMS – Fuel Storage Pool Water Level	**3.7.14**	**3.7.14**	The Davis-Besse LCO title is Spent Fuel Pool Water Level.
Verify the fuel storage pool water level	3.7.14.1	3.7.14.1	
PLANT SYSTEMS – [Spent Fuel Pool Boron Concentration]	**3.7.15**	**3.7.15**	
Verify the spent fuel pool boron concentration	3.7.15.1	3.7.15.1	
PLANT SYSTEMS – Secondary Specific Activity	**3.7.17**	**3.7.17**	
Verify the specific activity of the secondary coolant	3.7.17.1	3.7.17.1	
PLANT SYSTEMS – Steam Generator Level	**3.7.18**	**3.7.18**	
Verify steam generator water level	3.7.18.1	3.7.18.1	
ELECTRICAL POWER SYSTEMS – 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 from standby conditions and achieves steady state voltage and frequency (with pre-lube)	3.8.1.2	3.8.1.2	The Davis-Besse SR NOTE identifies a modified EDG start as idling and/or gradual acceleration, which differs from the STS NOTE, which specifies idling and gradual acceleration – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each DG is synchronized and loaded and operates	3.8.1.3	3.8.1.3	
Verify each day tank inventory	3.8.1.4	3.8.1.4	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
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	3.8.1.6	3.8.1.7	
Verify each DG starts from standby condition and achieves voltage and frequency	3.8.1.7	3.8.1.8	
Verify [automatic [and] manual] transfer of AC power sources	3.8.1.8	3.8.1.9	The Davis-Besse SR provides additional detail of the AC sources involved – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each DG rejects its associated single largest post-accident load	3.8.1.9	3.8.1.10	The Davis-Besse SR does not include the voltage and frequency limits applicable at 3 seconds after the load rejection – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each DG does not trip, and voltage is maintained during and following a load rejection	3.8.1.10	---------	
Verify response to a loss of offsite power signal	3.8.1.11	3.8.1.11	The Davis-Besse SR section c.2 specifies individual time delay relays instead of the load sequencer – this nomenclature difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify response to an ESF actuation signal	3.8.1.12	---------	
Verify each DG's noncritical automatic trips are bypassed	3.8.1.13	3.8.1.12	
Verify each DG operates for ≥ 24 hours	3.8.1.14	3.8.1.13	The Davis-Besse SR only requires the diesel generator to operate for 8 hours instead of 24 hours – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each DG starts and achieves voltage and frequency (without pre-lube)	3.8.1.15	3.8.1.14	
Verify each DG returns to ready-to-load operation	3.8.1.16	---------	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verity each DG returns to ready-to-load operation on ESF actuation signal	3.8.1.17	---------	
Verify interval between each sequenced load block	3.8.1.18	3.8.1.6	The Davis-Besse SR contains no NOTE and also specifies time delay relays in the scope of the SR – this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify response to a loss of offsite power signal in conjunction with an ESF actuation signal	3.8.1.19	3.8.1.15	
Verify simultaneous DG starts and achieves voltage and frequency	3.8.1.20	---------	
ELECTRICAL POWER SYSTEMS – Diesel Fuel Oil, Lube Oil, and Starting Air	**3.8.3**	**3.8.3**	
Verify each fuel oil storage tank inventory	3.8.3.1	3.8.3.1	
Verify lube oil inventory	3.8.3.2	3.8.3.2	The Davis-Besse SR specifies applicability “for each EDG” - this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each DG air start receiver pressure	3.8.3.4	3.8.3.4	The Davis-Besse SR includes the descriptor “required” - this difference does not impact the surveillance frequency or applicability of TSTF-425.
Check for and remove accumulated water from each fuel oil storage tank	3.8.3.5	3.8.3.5	
ELECTRICAL POWER SYSTEMS – DC Sources – Operating	**3.8.4**	**3.8.4**	
Verify battery terminal voltage	3.8.4.1	3.8.4.1	
Verify each battery charger capacity	3.8.4.2	3.8.4.2	The Davis-Besse SR includes the descriptor “required” - this difference does not impact the surveillance frequency or applicability of TSTF-425.

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify battery capacity	3.8.4.3	3.8.4.3	The Davis-Besse SR NOTE does not permit the SR to be performed to reestablish OPERABILITY in MODEs 1 - 4 – this difference does not impact the surveillance frequency or applicability of TSTF-425.
ELECTRICAL POWER SYSTEMS – Battery Parameters	**3.8.6**	**3.8.6**	
Verify each battery float current	3.8.6.1	3.8.6.1	
Verify each battery pilot cell voltage	3.8.6.2	3.8.6.2	The Davis-Besse SR specifies a limit “>”, instead of “≥”, the limit - this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify each battery connected cell electrolyte level	3.8.6.3	3.8.6.3	
Verify each battery pilot cell temperature	3.8.6.4	3.8.6.4	
Verify each battery connected cell voltage	3.8.6.5	3.8.6.5	The Davis-Besse SR specifies a limit “>”, instead of “≥”, the limit - this difference does not impact the surveillance frequency or applicability of TSTF-425.
Verify battery capacity - performance discharge test	3.8.6.6	3.8.6.6	The Davis-Besse SR NOTE does not permit the SR to be performed to reestablish OPERABILITY in MODEs 1 - 4 – this difference does not impact the surveillance frequency or applicability of TSTF-425.
ELECTRICAL POWER SYSTEMS – Inverters – Operating	**3.8.7**	**3.8.7**	
Verify inverter voltage, frequency, and alignment	3.8.7.1	3.8.7.1	The Davis-Besse SR includes the qualifier “for each inverter” and specifies alignment to “associated 120 VAC vital bus” instead of “required AC vital bus” – these differences do not impact the surveillance frequency of applicability of TSTF-425.
ELECTRICAL POWER SYSTEMS – Inverters – Shutdown	**3.8.8**	**3.8.8**	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify inverter voltage, frequency, and alignment	3.8.8.1	3.8.8.1	The Davis-Besse SR includes the qualifier "for the required inverter" and specifies alignment to "associated 120 VAC vital bus" instead of "required AC vital buses" – these differences do not impact the surveillance frequency of applicability of TSTF-425.
ELECTRICAL POWER SYSTEMS – Distribution Systems – Operating	**3.8.9**	**3.8.9**	
Verify correct breaker alignments and voltage	3.8.9.1	3.8.9.1	
ELECTRICAL POWER SYSTEMS – Distribution Systems – Shutdown	**3.8.10**	**3.8.10**	
Verify correct breaker alignments and voltage	3.8.10.1	3.8.10.1	
REFUELING OPERATIONS – Boron Concentration	**3.9.1**	**3.9.1**	
Verify boron concentration	3.9.1.1	3.9.1.1	
REFUELING OPERATIONS – Nuclear Instrumentation	**3.9.2**	**3.9.2**	
Perform CHANNEL CHECK	3.9.2.1	3.9.2.1	
Perform CHANNEL CALIBRATION	3.9.2.2	3.9.2.2	
REFUELING OPERATIONS – Containment Penetrations	**3.9.3**	**---------**	
REFUELING OPERATIONS – Decay Heat Removal (DHR) and Coolant Circulation – High Water Level	**3.9.4**	**3.9.4**	
Verify one DHR loop is in operation and circulating reactor coolant	3.9.4.1	3.9.4.1	
REFUELING OPERATIONS – Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level	**3.9.5**	**3.9.5**	
Verify one DHR loop is in operation	3.9.5.1	3.9.5.1	

Technical Specifications Section Title/Surveillance Description*	TSTF-425	DBNPS	Notes
Verify correct breaker alignment and indicated power available	3.9.5.2	3.9.5.2	The Davis-Besse SR includes a NOTE allowing the SR performance to be delayed for 24 hours after a pump is not in operation – this difference does not impact the surveillance frequency or applicability of TSTF-425.
REFUELING OPERATIONS – Refueling Canal Water Level	**3.9.6**	**3.9.6**	
Verify refueling canal water level	3.9.6.1	3.9.6.1	
Programs and Manuals (Surveillance Frequency Control Program)	**5.5.18**	**5.5.18**	Added to the Davis-Besse TS as part of the TSTF-425 change.

Note: Italicized text denotes DBNPS plant-specific TS or surveillances

* The Technical Specification Section Title/Surveillance Description portion of this table is a summary description of the referenced TSTF-425 (NUREG-1430)/DBNPS TS Surveillances, is provided for information purposes only, and is not intended to be a verbatim description of the TS Surveillances.

** This DBNPS Surveillance Frequency is provided in another program for the specific interval, is event driven, or is related to a certain condition.